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THE BOTANICAL SOCIETY AND EXCHANGE CLUB
OF THE BRITISH ISLES

Vol. XII. 1938-44

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1938	1939, July	...	P. M. Hall, Esq. (Editor)	Part i.
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ADDITIONS AND CORRECTIONS TO VOLUME XII

additional to those on p. 909
(issued with title-page to vol. XII, and to be cited as vol. XII,
p. i-iv: 1947).

NOTE.—The "*" is not added to species recorded for the vice-county in the "Welsh Plant List" of Hyde and Wade (1934); these have been entered by P. M. Hall into the Society's annotated copy of *C.F.*—ED.

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p. 39, line 20. Add "*" before "17."

p. 45, line 14. For "Chambers Odell, J. G. DONY" read "Odell, V. H. CHAMBERS, comm. J. G. DONY."

p. 247, line 28. Delete "*", (see *B.E.C. 1913 Rep.*, 395).

p. 253, line 15. For "2(2)b" read "2(3)b."

p. 254, line 27. For "12(i)" read "12(4)."

p. 255, line 2. Before "Wilmott" add "[*B.P.L.* /6b]."

——— line 4. Before "Wilmott" add "[*B.P.L.* /7b]."

——— line 7. Before first "Wilmott" add "[*B.P.L.* /8(1)]" and before second "Wilmott" add "[*B.P.L.* /8(2)]."

p. 256, line 3. After "Pugsl." add "[*B.P.L.* 550/10e]."

p. 257, lines 16 and 17. For "in more than one place . . . Mackechnie)" read "in the station where it was first detected (through the kindness of Mr R. Mackechnie), and also in another place in a different vice-county."

p. 259, line 1. For "3d" read "3f." [It should precede "×*S. Chouardi*" on p. 258.] [In *B.P.L.*, p. 105, under 10, add "×*viminalis* = *Chouardi* Chass. & Görz."]

p. 264, line 6 from bottom. For "1c" read "1d."

p. 265, line 22. Delete "*," (see *B.E.C. 1937 Rep.*, 463).

p. 266, line 5. Delete "*," (see *B.E.C. 1936 Rep.*, 237).

——— line 9 from bottom. Delete "*," (not listed in *C.F.*).

p. 268, line 2 from bottom. Delete "*" before 110, (see *B.E.C. 1929 Rep.*, 105).

p. 269, lines 19 and 22. For "coll." read "Coll,".

p. 274, lines 20 and 21. Delete (see *B.E.C. 1937 Rep.*, 472).

p. 276, line 2 from bottom. Before "Mount Pleasant" add "16, W. Kent;".

p. 280, line 16. Delete "*"

p. 288, line 15. Add "*" before "†".

p. 297, line 24. Delete "*" before "8".

——— line 5 from bottom. Add "*" before "31".

p. 298, line 5. Add "*" before "27".

——— line 8. After "Harrison" add "*et al.*" and after "4" add "as *P. angustifolius*".

p. 304, lines 4 and 6. Add "*" before "6" and "34".

p. 306, line 3. Delete "*", (is in *Welsh Ferns*, p. 111 (1940)).

p. 312, line 23. For "2(2)" read "2(3)".

p. 313, line 11. For "*quadrangulum*" read "*dubium*".

pp. 319-330. Many of these additions and corrections were in P. M. Hall's annotated copy, and should have been omitted.

p. 321, line 31. Delete: the original spelling is *Evonymus*.
p. 322, lines 14 and 15. Delete: it was not extinct.
p. 329, line 30. For "380" read "381".
p. 331, line 3. Before "Edward" add "Extracted by".
p. 342, line 13. Add "*" before 112/12.
p. 344, line 23. Add "*" before "186/1".
p. 348, line 26. Add "*312/2." before "Var. *cambrica*".
p. 453, line 24. For "1940" read "1941".
p. 468, line 15 from bottom. For "9" read "9k".
p. 472, line 3 from bottom. After "*maciana*" add "[*B.P.L.* 18c]".
p. 473, line 1. After "*imbricata*" add "[*B.P.L.* 5h]".
p. 474, line 28. For "Freyer" read "Fryer".
p. 485, line 16. For " N.J." read " N.Y.".
p. 487, line 1. For " 190/1. . . . PUBESCENS Lam." read " 190/5. ALCHEMILLA PASTORALIS Buser." I agree with this determination by S. M. WALTERS: the plants are very small—A. J. WILMOTT.
p. 488, lines 8 and 9 from bottom. Delete "*" and Hereford record, (see *B.E.C. 1939-40 Rep.*, 277).
p. 489, line 14 from bottom. Add "*" before "30".
p. 490, line 6 from bottom. Add "*" before "7".
p. 491, line 10 from bottom. For "WLMOTT" read "WILMOTT".
p. 492, line 21. Delete "*", (see *B.E.C. 1939-40 Rep.*, 283); and line 22, delete "Barmouth Junction, 1940, and".
p. 494, line 24. Delete "*", (see *B.E.C. 1939-40 Rep.*, 284.)
——— lines 25 and 26. Delete first Merioneth record.
p. 498, line 17 from Bottom. Delete "[*]".
——— lines 15 and 16 from bottom. Delete E. Glos. record, (see *B.E.C. 1939-40 Rep.*, 287).
——— lines 3, 4, and 5 from bottom. Delete "[*]" and "*", (not listed in *C.F.*).
p. 499, line 4. Delete "[*]".
——— lines 6 and 7. Delete N. Hampshire record, (see *B.E.C. 1939-40 Rep.*, 368).
p. 502, line 12 from bottom. Delete "*".
p. 503, lines 2 and 3 from bottom. "*", (not listed in *C.F.*).
p. 504, line 10. Delete "*".
p. 505, line 12 from bottom. Add "*" before "†".
——— line 7 from bottom. Add "*" before "†".
p. 506, line 25. Add "*" before "63".
p. 507, line 8. Add "*" before "23".
——— line 12 from bottom. Add "*" before "24".
p. 509, lines 19 and 20. Delete record, (see *B.E.C. 1939-40 Rep.*, 302).
p. 511, lines 1 and 2. Delete Wilts. record, (see *B.E.C. 1939-40 Rep.*, 304).
p. 526, line 22. For "103B" read "103M".
p. 534, line 18. Add "[see *B.E.C. 1939-40 Rep.*, 271]".
——— bottom line. Add "[see *B.E.C. 1919 Rep.*, 650.—ED.].
p. 535, line 8. Add "[see *B.E.C. 1918 Rep.*, 376]".

p. 535, line 13 from bottom. Add "[*B.E.C., 1915 Rep.*, 266]".
p. 538, lines 17 and 18. Delete, (see p. 541).
——— line 14 from bottom. Add "[and see *B.E.C. 1922 Rep.*, 742]".
p. 544, line 21. Add "*" before "*S. rubra*".
p. 549, line 19 from bottom. Delete " 67," (see *B.E.C. 1937 Rep.*, 501).
——— line 13 from bottom. For "1 bis" read "2(2)" (see *B.E.C. 1939-40 Rep.*, 257).
p. 575, line 1. For "R. TRIANGULIVALVIS" read "**R. triangulivalvis**".
p. 579, line 6. For "R. TENAX" read "**R. tenax**".
p. 594, line 12. For "4 inches" read "5 inches."
p. 662, line 18. After "p." add "788".
p. 663, line 27. Transfer the ")" after "Bip." to line 28 after "547".
p. 665, lines 10 and 11 from bottom. Delete (see *B.E.C. 1941-42 Rep.*, 552).
p. 671, lines 8 and 9 from bottom. Delete.
——— line 6 from bottom. For "Howarth" read "Lej. & Court.", (see p. 775).
p. 673, lines 18-27. Transfer to follow line 7.
p. 678, line 22. Add "*" before "16".
pp. 698-778. A "†" should be added to species not listed in heavy type in *B.P.L.*, where this has not been done.
p. 699, line 12. For "6, N. Som." read "5, S. Som."
p. 703, line 4 from bottom. Delete "*". (see *B.E.C. 1939-40 Rep.*, 244).
p. 704, line 22. Add "*" before "33".
p. 704. line 26. For "6, N. Som." read "5, S. Som." Already recorded from this locality in Marshall, *Suppl. Fl. Som.* (1914).
p. 707, line 3 from bottom. Delete "*", (see *B.E.C. 1941-42 Rep.*, 534).
p. 709, line 13. Delete "*", (see *B.E.C. 1939-40 Rep.*, 244).
p. 712, line 14. Add "*" before "142/2" and "H.12." [New to Ireland].
p. 718, lines 12 and 11 from bottom. Delete "*" (see *B.E.C. 1939-40 Rep.*, 322).
p. 721, line 1. Delete "*", (see *B.E.C. 1941-42 Rep.*, 535).
p. 723, line 9 from Bottom. Add "*" before "220/7" and "101".
p. 724, line 7. For "Tingnath" read "Tringeith."
——— line 22. For "Harborne" read "Husborne."
p. 729, lines 22, 24, 25. Delete "*" and reference to *C.F.*
p. 731, line 3. Delete "*" before "103", see *B.E.C. 1939-40 Rep.*, 249.
p. 736, line 10. Add "*" before "H.12" and "H.13".
p. 737, line 15. Add "*" before "H.13".
p. 739, line 11. Delete "*" before "†" and "47", (see *B.E.C. 1939-40 Rep.*, 286).
p. 740, line 8. Delete "*" (see *B.E.C. 1934 Rep.*, 833).
p. 745, line 18. Add "*" before "H.13".
——— line 10 from bottom. Add "*" before "†".
——— line 6 from bottom. Add "*" before "†".
p. 748, line 2. Delete "," after "Boxley".
p. 749, line 6. Add "and C. WEST" after "ROSE".
p. 752, lines 16 and 17. Add "*" before "618/11" and "H.12".
——— line 9 from bottom. Add "*" before "†" and "12".

p. 755, line 4. Add "*" before "†" and "47".
——— line 4 from bottom. Delete "*" (both).
p. 756, line 9. For "coll" read "Coll".
p. 757, line 3. Delete "*", (see *B.E.C. 1937 Rep.*, 506).
——— lines 9 and 11. Delete "*": recorded in *Top. Bot. Supp.* 2.—add to *C.F.*
——— line 8 from bottom. Names should be in ordinary, not heavy, type, and (lines 8 and 9), for "T. & T. A. Steph." read "Wilmott".
p. 759, line 14. Add "*" before "619/3" and "3".
p. 760, line 24. Delete "*" before "63".
p. 763, line 19. Add "*" before "737/25".
p. 764, line 5 from bottom. Delete "*" before "110".
p. 769, line 9 from bottom. For "one" read "once."
p. 770, lines 10 and 14. For "Doll." read "Döll.".
——— line 11 from bottom. Add "*" before "770/6".
p. 771, line 4. Add "*" before "780/2(2)" and "104".
——— lines 6 and 7. Add "*" before "780/2(2)a" and "17".
p. 772, line 5 from bottom. Add "*" before "820/1" and "104".
p. 773, line 9. Add "*" before "†".
p. 774, line 13 from bottom. For "Wolfreton" read "Wolferton".
p. 778, line 8. Add "*" before "104".
p. 807, line 27. For "Turner" read "Townsend."
p. 808, line 12 from bottom. For "rubur" read "ruber".
p. 810, lines 12-14 from bottom. Delete "*": for "/1" read "/3": for " Kali L." read PESTIFERA Nels.: delete "Probably var. TENUIFOLIA Tausch." and "Add in brackets to *C.F.*"
p. 811, bottom line. For "Turner" read "Townsend."
pp. 823-830, several places. For "Achandantuir" read "Achadantuir."
p. 825, line 18. Delete "*"; there are several previous records, one by Druce himself (*B.E.C. 1923 Rep.*, 20).
p. 827, line 19. Add "*" before "497/1b".
——— line 22. Delete "*" (recorded by Druce (1908: *Ann. Scot. N.H.*, 106), but omitted from *C.F.*).
p. 841, line 7. For "*laciniata*" read "**laciniata**".
p. 843, line 1. For "*Lousleyi*" read "**Lousleyi**".
p. 844, line 1. For "*schizopetala*" read "**schizopetala**".
——— line 8 from bottom. For "*apetala*" read "**apetala**".
p. 852, line 11 from bottom. For "*Palmstruchii*" read "**Palmstruchii**", and after "Lindm." add "[*B.P.L.* 196/2(3)]".
p. 887, line 15. For "Sers." read "Sess.".
p. 891, line 9 from bottom. For "North" read "Mid."
p. 892, line 7. After "*et al.*" add "(1944)".
——— line 20. For "Sers." read "Sess.".
p. 894, line 2. Delete ",".
p. 903, line 2 from bottom. Delete "Birch.".
p. 908, line 10 from bottom. For "A. J." read "E. J.".

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1938

(WITH BALANCE SHEET AT 31st DECEMBER 1938)

BY THE

HONORARY EDITOR

PATRICK M. HALL.

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(VOL. XII. PART I).

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12 HIGH STREET, FAREHAM, HANTS.

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JULY 1939.

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Colman, Sir Jeremiah, Bart., Gatton Park, Reigate, Surrey.
Colquhoun, Lady, Rossdhu, Luss, Dumbarton.
Colville, Mrs, Bowden Hall, Gloucester.
Cooke, R. B., Kilbryde, Corbridge-on-Tyne, Northumberland.
Cornell, New York State College of Agriculture, Cornell Univ., Ithaca, N.Y., U.S.A.
*†Corstorphine, R. H., B.Sc., F.L.S., Hillside House, Arbroath.
*†Corstorphine, Mrs R. H., Hillside House, Arbroath.
Cory, Miss A. M., Fullerton Manor, Andover, Hants.
†Cowin, W. S., "Kenwood," Brunswick Road, Douglas, I. of Man.
Crawshaw, Lady, Whatton, Loughborough, Leicestershire.
Creed, Dr R. S., M.A., New College, Oxford.
Crerar Library, John, 86 East Randolph Street, Chicago, Ill., U.S.A.
Crisp, Wm. C., School House, Stewkley, Leighton Buzzard, Beds.
Cross, E. R., St Oswalds, 12 Filey Road, Scarborough.
Cross, Hon. Marjorie, Ash House, Broughton-in-Furness.
†Cruttwell, Norman E. G., Coombe, Yattendon, Berks.
Curtis, C. H., F.L.S., 33 John Street, Theobalds Road, W.C.1.
†Curtis, Sir Roger, Bart., The Midland Hotel, Derby.

Daltry, Dr H. W., Bar Hill, Madeley, Crewe, Staffs.
Daly, Mrs Bowes, Dunsandle, Athenry, Co. Galway.
†Dandy, James E., M.A., F.L.S., Dept. of Botany, Brit. Mus. (Nat. History), Cromwell Road, S.W.7.
Darlington and Teesdale Nat. Field Club, c/o R. H. Sargent, Danescroft, Cleveland Avenue, Darlington.
David, Miss Aileen, The Hêndre, Llandaff, Cardiff.
†Davy, Lady, Churchfield, West Byfleet, Surrey.
Day, Miss E., Flint House, Sandwich, Kent.
†Day, F. M., M.A., The Downs School, Colwall, Malvern, Worcs.
Delhanty, J. E., "Cefn Mably," 7 Princes Avenue, Cardiff.
Dent, G., 2 Park Cottages, Limpsfield, Surrey.
Dent, Mrs R. W., O.B.E., Flass, Maulds Meaburn, Penrith.
Devonshire, The Duke of, Chatsworth, Buxton, Derbyshire.
Dickinson, Mrs E. M., 6 Longworth Lane, near Abingdon, Berks.
Dixon, H. N., M.A., F.L.S., 17 St Mathew's Parade, Northampton.
†Dony, J. G., B.Sc., 41 Somerset Avenue, Luton, Beds.
†Druce, Francis, M.A., F.L.S., 60 Burton Court, S.W.3.
Ducie, Earl of, Whitfield, Falfield, Gloucester.
Dufferin, Brenda, Marchioness of, Sheldon Manor, Chippenham, Wilts.
†Duncan, Miss Ursula K., Parkhill, Arbroath.
*Dunston, Capt. Ambrose E. A., Burltons, Donhead St Mary, near Shaftesbury, Dorset.
Dymes, T. A., F.L.S., St Audries, 23 Norton Road, Letchworth, Herts.

*†Edees, E. S., M.A., 19 Dartmouth Avenue, Westlands, Newcastle, Staffs.
Edgar, Lady, Oak End, Lower Amersham Road, Gerard's Cross, Bucks.
Eire, The National Museum, Kildare Street, Dublin.
Eire, Controller, Stationery Office (Publications Branch), Dublin.

†Eliot, Lady Alethea, 8 Carlyle Square, Chelsea, S.W.3.
†Ellis, A. E., M.A., F.L.S., Epsom College, Surrey.
†Ellis, E. A., 84 Springfield Road, Gorleston, Suffolk.
Ellis, Edgar W., Gedham, Ossett, Yorks.
†Evans, Dr A. H., F.R.S.E., Cheviot House, Crowthorne, Berks.
Evetts, Mrs, J.P., Wood House, Tackley, Oxon.
Eyre, Mrs R. S. K., Woodside, Crowborough, Sussex.

Falkner, J. Meade, M.A., Durham.
†Fanshawe, D. B., Fairydene, Wheeler Avenue, Oxted, Surrey.
Farrer, Mrs James, Ingleborough House, Clapham, Yorks.
Findeisen, Kenneth Desmond, Yonder Fowdon, Churston Ferrers, S. Devon.
†Flintoff, R. J., F.L.S., F.C.S., F.Z.S., Water Ark Lodge, Goathland, Yorks.
†Foggitt, Mrs T. J., J.P., Stoneybrough, Thirsk, Yorks.
Fortescue, W. Irvine, M.B., C.M., Kingcausie House, Maryculter, Milltimber, Aberdeen.
*Foster, Henry, 48 Ridge Road, Armley, Leeds.
†Frankland, J. N., Plemont, 9 Lancaster Gate, Nelson, Lancs.
†Fraser, G. T., B.A., 71 Fore Street, Kingskerswell, Newton Abbot, S. Devon.
Fry, Miss C. S., The Manor House, Upton, Didcot, Berks.

Gambier-Parry, Mrs B., Duntisbourne Rouse, Cirencester, Glos.
Garnett, C. S., A.Met., F.L.S., F.C.S., F.G.S., 6 The Strand, Derby.
Gates, Prof. R. Ruggles, F.R.S., 33 Woburn Square, W.C.1.
Geldart, Miss, Colman Road, Norwich.
Genève, Le Directeur du Conservatoire et du Jardin Botanique de la Ville de, Suisse.
Gibbons, H. J., 3, Wanscow Walk, Henleaze, Bristol.
†Gilmour, J. S. L., M.A., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Gladstone, Viscountess, 27 Chester Terrace, S.W.1.
Glynn, Hon. Mrs Maurice, 2 Weymouth Street, W.1.
Godalming Nat. History, Footpath and Rambling Society, (Hon. Sec.) E. B. Bishop, Lindfield, Marshall Road, Godalming.
†Goddard, H. J., The Knap, Skewbridge, Wilton Road, Salisbury.
Godman, Miss E., South Lodge, Horsham, Sussex.
Godman, Miss C. E., 45 Pont Street, S.W.1.
Gomersal, Mrs, High Kelling, Holt, Norfolk.
Gordon, Seton, Duntulm Lodge, Skye.
†Gough, Mrs H., Raford, Athenry, Co. Galway.
†Gough, J. W., M.A., 43 Sandfield Road, Headington, Oxford.
Graham, Mrs E., 9 Ralston Street, Tedworth Square, S.W.3.
†Graham, Rex, 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Mrs H., 40 Orchard Court, Portman Square, W.1.
Graham, Prof. R. J. D., M.A., D.Sc., F.R.S.E., Botany Dept., The University, St Andrews, Fife.
†Graveson, A. W., M.A., The Grammar School, Beaminster, Dorset.
Gray Herbarium, The, Harvard University, Cambridge, Mass., U.S.A.
Gray, H., Yewtree, West Malling, Kent.
†Green, T. H., Sabinal, Weston, Bath.
*Greenkeeping Research, Board of, St Ives Research Station, Bingley, Yorks.
Gregor, Rev. A. G., Firle Rectory, Lewes, Sussex.
Grenfell, Miss M., Bacres, Henley-on-Thames.
Griffiths, B. Millard, D.Sc., F.L.S., University Science Laboratories, South Road, Durham.
*†Grose, J. Donald, 18 Regent Street, Swindon.

*†Haines, J. W., Midhurst, Hucclecote, Gloucester.
Haines, Mrs J. W., Midhurst, Hucclecote, Gloucester.
†Hall, Mrs E. M. Macalister, Killean, Tayinloan, Argyllshire.
†Hall, F. T., 2 Hartington Terrace, West Road, Buxton, Derbyshire.

Hall, L. Beeching, F.L.S., Bryn Aird, Blake Hill Crescent, Parkstone, Dorset.
Hall, Miss M., 1 Broad Walk, Weobley, Herefordshire.
*†Hall, Patrick M., M.C., F.L.S., 12 High Street, Fareham, Hants.
Hancock Museum, The, Barras Bridge, Newcastle-upon-Tyne.
†Hardaker, W. H., M.Sc., 451 City Road, Edgbaston, Birmingham, 17.
Hardinge, Hon. Lady Alexander, St James's Palace, S.W.1.
†Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., Botany Dept., Armstrong College, Newcastle-upon-Tyne.
Hartley, J. W., Vallona, London Road, Prestbury, Cheshire.
Harvey, Rev. H. H., Clawton Vicarage, Holsworthy, Devon.
Hassall, Mrs B., Hithercroft, Goodworth Clatford, Andover, Hants.
Haughton, Dr J. W., Tawnachie, Wood Lane, Falmouth.
†Haynes, Gerald, 8 Canterbury Road, Oxford.
*Hayward, Miss I. M., F.L.S., 7 Abbotsford Road, Galashiels.
†Heath, Rev. D. M., Little Compton Vicarage, Moreton-in-Marsh, Glos.
*Helsby, I., 3 Kingsfield Road, Watford, Herts.
Henley, Lord, Watford Court, Rugby.
Heron, Miss M., Erclands, Ercall Lane, Wellington, Salop.
Hichens, Mrs, Windyridge, Fort Road, Guernsey.
Hill, S. Ashton, 79 John Street, West Bromwich.
Holder, F. W., 17 Balmoral Drive, Churchtown, Southport.
Holland, J. S. (Westwell Manor, Burford, Oxon), New Modderfontein Staff Mess, P.O. Van Ryn Benein, S. Africa.
Horticultural Society, The Royal, Vincent Square, Westminster, S.W.1.
*†Howarth, Dr W. O., F.L.S., Dept. of Botany, The University, Manchester.
Hull, University College, Dept. of Botany, Hull.
Hurst, Miss Barbara, Rusper Nunnery, Horsham, Sussex.
Hurst, C. P., F.L.S., Landulph Rectory, Saltash, Cornwall.
Hutchinson, R. R., 11 Fryston Avenue, Croydon, Surrey.

Imperial Forestry Institute, Oxford, The Librarian.

Jack, James, F.L.S., 102 High Street, Arbroath.
Jack, James, Luggiebank, Cumbernauld Station, Glasgow.
†Jackson, A. Bruce, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
Jekyll, Francis, Munstead House, Godalming, Surrey.
Jenkins, T. J., D.Sc., Agricultural Buildings, University Coll. of Wales, Aberystwyth.
*Johnston, Col. H. H., C.B., C.B.E., M.D., D.Sc., F.L.S., c/o Messrs Glyn Mills & Co., Holt's Branch, Kirkland House, Whitehall, S.W.1.
Jones, E. Marsden, F.L.S., Church House, Potterne, Devizes, Wilts.
Jowett, Miss E. B., Oreton Mount, Grange-over-Sands.

Kempthorne, R., Penolver, The Lizard, Cornwall.
Kennedy, Mrs C. Moore, c/o Westminster Bank Ltd., Bromley, Kent.
†Kew, H. Wallis, 60 Richmond Park Road, East Sheen, S.W.14.
Kirby, Mrs G. E., Lloyds Bank Chambers, Bank Street, Ashford, Kent.
Knight, H. H., M.A., The Lodge, All Saints Villas, Cheltenham.

Lamb, Joshua, Sibford, Banbury, Oxford.
*Lang, Mrs D. K., Wyse Hill, Finchampstead, Berks.
Lansdowne, Marchioness of, Bowood, Calne, Wilts.
*Last, G. V. C., F.L.S., M.R.C.S., L.R.C.P., 22 Rutland Ae., Sefton Park, Liverpool.
†Lawn, J. G., C.B.E., Hon. D.Sc., Long Acre, Shamley Green, Guildford.
Leadbitter, E. C. E., C.V.O., 160 Addiscombe Road, Croydon, Surrey.
†Leake, Miss P. A., Minto House, Hawick, Scotland.
†Leather, Miss Vivien M., Wyards, Studland, Swanage, Dorset.
†Lee, J. R., 96 Finlay Drive, Dennistoun, Glasgow.
Legard, Lady Edith, Maes Court, Tenbury, Worcester.
*Leicester Museum and Art Gallery, Leicester.

†Leighton-Hare, Christopher, M.Sc., Dept. of Botany, The University, Aberdeen.
†Lindquist, Dr B., Skogshogskolan Experimentalfaltet, Stockholm, Sweden.
Linnean Society, The, Burlington House, Piccadilly, W.1.
Little, Miss K. D., 19 The Avenue, Hitchin, Herts.
Lofthouse, T. Ashton, F.L.S., The Croft, 14 Cambridge Road, Middlesbrough. 10.
London Nat. Hist. Soc., Botany Section, c/o G. R. A. Short, 36 Parkside Drive, Edgware, Middlesex.
*†Long, J. W., Hillside, St John's Road, Newport, I. of Wight.
Longfield, Miss C., F.R.G.S., F.E.S., F.Z.S., M.B.O.U., 20 Pont Street, S.W.1.
†Lousley, J. E., 7 Penistone Road, Streatham Common, S.W.16.
Loyd, Lady Moyra, Langleybury, King's Langley, Herts.
Lucas, Baroness, 22 Sussex Sq., Hyde Park, W.2.

McCrea, Mrs M. A., 4 Springfield Terrace, King's Road, Guernsey.
McClean, Prof. R. C., D.Sc., 3 Chariot Road, Pencisely Road, Cardiff.
McClintock, David, Hayes Rectory, Kent.
McGill, J. F., c/o Messrs McGill & Smith, Ayr.
McGuire, Miss Ann, 68 Park Lane, Chippenham, Wilts.
†McInnes, Latimer, Briarlea, Campbeltown, Argyll.
†Mackechnie, R., B.Sc., 9 Skirving Street, Shawlands, Glasgow, S.1.
Mackenzie, Major Roderick, Fawley Court, Henley-on-Thames.
Macmillan, Lord, 44 Millbank, Westminster, S.W.1.
Magor, E. W. M., Lanellan, S. Tudy, Cornwall.
†Makins, F. K., Great Down Cottage, Bruton, Bath, Somerset.
Manchester Public Libraries (C. Nowell, F.L.A., Chief Lib.), Piccadilly, Manchester.
Manchester, Keeper of the University Museum.
Manfield, Mrs H., Moulton Grange, Northampton.
†Marks, C. E., Islington Cemetery, East Finchley, N.12.
Marlborough, The Duchess of, Blenheim Palace, Woodstock, Oxon.
Marsh, Miss F. H. B., J.P., F.L.S., Thornleigh, Mordiford, Hereford.
†Martin, Rev. W. Keble, M.A., F.L.S., The Vicarage, Torrington, N. Devon.
Mason, Lady Evelyn, Eynsham Hall, Witney, Oxon.
Massy, Miss Narcissa C., Two Oaks, Marley Common, Haslemere, Surrey.
Matthews, Prof. J. R., M.A., F.L.S., Dept. of Botany, The University, Old Aberdeen.
*†Melville, R., B.Sc., Ph.D., F.L.S., Royal Botanic Gardens, Kew.
Meynell, Miss D., Hoar Cross, Burton-on-Trent, Staffs.
†Mills, J. N., Glazenbridge, Shrawley, near Worcester.
Mills, Dr W. H., F.R.S., 23 Storey's Way, Cambridge.
Milne, Jas. Fairweather, M.A., M.B., Ch.B., Rocksley House, Boddam, Peterhead, Aberdeenshire.
†Milne-Redhead, E., B.A., The Herbarium, Royal Bot. Gardens, Kew, Surrey.
†Milvain, Mrs M., Green Close, Snowshill, near Broadway, Worcs.
Morley, Earl of, Saltram, Plympton, Devon.

†Nannfeldt, Dr John Axel, Botaniska Institutionen, Uppsala, Sweden.
National Institute of Agricultural Botany, Huntingdon Road, Cambridge.
†Neild, Miss A. M., Ridge House, Cold Ash, Newbury, Berks.
†Nelmes, E., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
*Nelson, G. A., Ph.C., F.L.S., 37 The Crescent, Adel, Leeds, 6.
Newman, Mrs R., 11 Cadogan Square, S.W.1.
New York Botanical Garden (W. J. Robbins, Director), Bronx Park, N.Y., U.S.A.
Norton, F., "Westward Ho," 3 Pencisely Rise, Cardiff.
Nottingham Public Nat. History Museum, Wollaton Hall, Nottingham.
Nutt, David (A. G. Berry), 212 Shaftesbury Avenue, W.C.2.

Oddy, Mrs, Heath House, Holt, Norfolk.
Orme, Mrs R., c/o Westminster Bank Ltd., Exmouth, Devon.

Oslo, The Botanical Museum of the University of, Norway.
Oxford University, Dept. of Botany, The Librarian.
Oxford City Library, Town Hall, Oxford.

†Palmer, Hon. W. J. L., F.L.S., 14 Buckingham Palace Gardens, S.W.1.
Parkin, J., M.A., F.L.S., Blaithwaite, Wigton, Cumberland.
Patey, W. J., Nock Hill, Denham, Bucks.
Patton, Donald, M.A., B.Sc., Ph.D., 15 Jordanhill Drive, Glasgow, W.3.
Pearson, C., Narin, Holmston Avenue, Glenageary Hill, Kingstown, Co. Dublin.
Perrins, Miss Alice, 33 Inverness Terrace, Bayswater, W.2.
Penson, J. H., 11 Well Walk, Hampstead, N.W.3.
Pharmacie, Bibliotheque de la Faculte de, 4 Avenue de la Observatoire, Paris, France.
Phelps, Mrs J. V., Woodbury, East Avenue, Bournemouth.
†Phillips, Hugh, 803 Raleigh House, Dolphin Square, Grosvenor Road, S.W.1.
†Pickard, Miss Kathleen, Glynde, Lewes, Sussex.
Pinkett, Miss Mary M., " Sunnymead," Braunton, Devon.
Post, Miss Eliz., 58 Eccleston Square, S.W.
Pownall, Rev. G. C., " Norman Dene," Charlton Kings, Cheltenham.
Price, W. R., Cockleford Mill, Cowley, near Cheltenham.
Priestley, Prof. J. H., B.Sc., D.S.O., Dept. of Botany, The University, Leeds.
†Prime, C. T., M.A., F.L.S., 56 Avondale Road, Croydon, Surrey.
Proctor, A. R. S., F.L.S., Netherclose, Hazelwood Road, Duffield, near Derby.
†Pugsley, H. W., B.A., F.L.S., 81 Alexandra Road, Wimbledon, S.W.19.

*†Ramsbottom, J., O.B.E., M.A., Dr.Sc., P.L.S., Keeper, Dept. Botany, British Museum (Nat. History), Cromwell Road, S.W.7.
†Rawlins, Miss E., Holbecks, Hadleigh, Suffolk.
Rea, Carleton, M.A., B.C.L., Memb. Hon. Soc. Mycologique de France, 6 Barbourne Terrace, Worcester.
Rees, John, B.A., M.Sc., Adviser in Agric. Botany, Univ. Coll. of S. Wales and Monmouth, Cathays Park, Cardiff.
Reynolds, Bernard, 18 Maxilla Gardens, London, W.
Rice, H. E. H., Northcourt, Eastry, Kent.
Richards, Mrs, Caergnwch, Dolgelly, N. Wales.
†Riddelsdell, Rev. H. J., M.A., A.L.S., 4 Wolverley House, Goring, Reading, Berks.
Ridley, H. N., C.M.G., F.R.S., 7 Cumberland Road, Kew Gardens, Surrey.
Ridley, Hon. Mrs J., Mockbeggars Hall, Claydon, Suffolk.
*†Rilstone, F., A.L.S., Lambourne Hill, Penhallow, Truro, Cornwall.
*†Rob, Miss C. M., Catton Hall, Thirsk, Yorks.
Robbins, R. W., Bullens Lee, Pains Hill, Limpsfield, Surrey.
†Roche, The Lady, Chadlington, Oxford.
*Rose, Mrs Eric, Leweston Manor, Sherborne, Dorset.
Rothschild, Lionel de, 46 Park Street, London, W.
†Russell, Lady Victoria, Ridgeway, Shere, Guildford, Surrey.

Salisbury, Prof. E. J., D.Sc., F.R.S., Willowpool, Radlett, Herts.
†Salmon, Miss Hilda, The Close, Broughton, Hants.
†Sandwith, Mrs C., 26 Canynge Square, Clifton, Bristol.
†Sandwith, N. Y., M.A., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
Sargent, R. H., Danescroft, Cleveland Avenue, Darlington.
Saunders, Miss E. F., Ortler, Bouncers Lane, Prestbury, Cheltenham, Glos.
†Severn, Lady, Winterbrook Lodge, Wallingford, Berks.
Seward, Mrs Olive G., Weston House, near Petersfield, Hants.
†Shaw, H. K. Airy, B.A., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
Sherrin, W. R., A.L.S., South London Bot. Institute, 323 Norwood Road, London, S.E.24.
Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex.

*†Simpson, N. D., M.A., F.L.S., Maesbury, Cavendish Road, Bournemouth.
Skene, Prof. Macgregor, D.Sc., Dept. of Botany, The University, Bristol.
*†Sledge, Dr W. A., 9 St Chad's Drive, Headingley, Leeds, 6.
Small, Prof. J., D.Sc., Dept. of Botany, Queen's University, Belfast.
†Smith, R. L., 24 Grand Avenue, Ely, Cardiff.
Smith, Prof. Sir William Wright, D.Sc., Royal Botanic Gardens, Edinburgh.
†Smith, Dr H. B. Willoughby, St Clements, Carson Road, Gainsborough, Lincs.
Southall, A. W., Cliffords Mesne, Newent, Glos.
South London Botanical Institute, 323 Norwood Road, S.E.24.
Southron, T. W., Rothley, 51 Birches Barn Road, Penn Fields, Wolverhampton.
†Sowter, F. A., Ashtead, North Avenue, Leicester.
†Sprott, W. A. P., The Friary, Appleby, Westmorland.
Stationery Office, H.M., Princes Street, Westminster, S.W.1.
†Stephenson, Rev. T., D.D., 15 Priory Avenue, Kingskerswell, Newton Abbot, S. Devon.
Stevenson, Miss E. H., Training College, The Close, Salisbury.
Stern, Major F. C., O.B.E., M.C., 16 Montagu Square, W.1.
Stewart, Mrs M. E., Partney, Spilsby, Lincs.
Stewart-Sandeman, Mrs, The Laws, Kingennie, Angus.
†Still, A. L., B.A., Roslyn, Dower Avenue, Wallington, Surrey.
Stuart, Mrs C. U., 120 London Road, Worcester.
Stuart-Edwards, J. J., Imperial Hotel, Exmouth, S. Devon.
Swaine, Miss A. K., Pisang Cottage, Nailsea, Somerset.
*Swann, Eric L., "Russetts," Wootton Road, King's Lynn, Norfolk.
Swanton, E. W., Educational Museum, Haslemere, Surrey.

Tahourdin, C. B., M.A., 86 Manor Road, Wallington, Surrey.
Taylor, Miss M., 6 Kent Gardens, Ealing, W.13.
†Taylor, Dr G., Dept. of Botany, British Museum (Nat. History), Cromwell Road, S.W.7.
†Taylor, S. A., 34 Nelson Street, Leicester.
Teacher, Mrs Norman, Clon Bur, Co. Galway, Eire.
†Temperley, G. W., "Restharrow," Apperley Road, Stocksfield-on-Tyne.
Templeman, Andrew, Geological Museum, Exhibition Road, S.W.7.
†Thomas, Charles, "Arden," 48 Manor Road North, Edgbaston, Birmingham, 16.
Thomas, Miss E. Mary, Moorfield, Nottage, Porthcawl, Glam.
Thorold, C. A., Hele, Bradninch, Devon.
Tindall, Mrs K. B., West Downs, Winchester, Hants.
†Todd, Miss E. S., Aldbourne, Marlborough, Wilts.
Toke, C. H., The Haven, Green Lane, Jarvis Brook, Sussex.
Travis, W. G., 9 Barton Road, Liverpool.
Trethewy, A. W., Artillery Mansions, Victoria Street, S.W.1.
Tristram, Mrs R. M., F.L.S., Cox's Mill, Dallington, Sussex.
Trow, Principal A. H., D.Sc., 9 Clive Crescent, Penarth, S. Wales.
Tunbridge Wells Municipal Museum, 6 Upper Grosvenor Road, Tunbridge Wells, Kent.
Turnbull, Miss Evelyn, The Mill House, Hildenborough, Kent.
†Turner, A., 140 Pine Street, Nelson.
Turner, G. Cresswell, F.L.S., 15 Church Gate, Leicester.
†Turrill, W. B., D.Sc., F.L.S., 70 Manor Road, Richmond, Surrey.

Ullman, R. B., The Brewery, Limehouse, E.14.

†Vachell, Miss E., F.L.S., Fairfield, Ely Road, Llandaff, Cardiff.
Valentine, D. H., M.A., Ph.D., Botany School, Cambridge.
Verey, Mrs Cecil, Buckland Rectory, Broadway, Worcester.
Victoria, The Public Library of, Melbourne, c/o H. Sotheran, 2, 3, 4 and 5 Sackville Street, Piccadilly, W.1.
Vivian, Miss Clarice, F.L.S., 37 Wilton Crescent, S.W.1.

†Wade, A. E., F.L.S., Dept. of Botany, National Museum of Wales, Cardiff.
Waldy, Hon. Mrs, "Sonamerg," Higher Sea Lane, Charmouth, Dorset.
*Wales, National Museum of, Dept. of Botany (Keeper, H. A. Hyde, M.A., F.L.S.), Cardiff.
*†Wallace, E. C., 2 Strathearn Road, Sutton, Surrey.
†Wallis, J. R., Timberlog, Lamberhurst, Kent.
†Warner, S. A., "Whitelea," 122 Broadway, Didcot, Berks.
Warren, W. E., "Selborne," Horsell Rise, Horsell, Surrey.
Washington, U.S. Dept. of Agriculture, The Librarian, Washington, D.C., U.S.A.
Watchorn, Miss Elsie, Cartreple, Luard Road, Cambridge.
†Watney, Lady Margaret, Williamstrip, Fairford, Glos.
†Watson, W., Rosedale, 245 Southlands Road, Bickley, Kent.
†Watts, Lt.-Col. G. A. R., Highbury, Victoria Road, Fleet, Hants.
Webster, Miss M. McCallum, Colleonard, Banff.
Wedgwood, Mrs, 2 Hatherley Road, Kew Gardens, Surrey.
Wedgwood Herbarium, The, Marlborough College, Wilts.
Weiss, Prof. F. E., F.R.S., "Easedale," Woodway, Merrow, Guildford.
†Welch, Mrs, B.Sc., 49 Lichfield Court, Richmond, Surrey.
Wells, Mrs E. M., 91 Colum Road, Cardiff.
Weyer, Major Bates Van de, South Marston Manor, Swindon.
Weyer, William Van de, Clyffe, Dorchester, Dorset.
Whyte, J. S., 57 Guthrie Port, Arbroath, Angus.
†Wilde, Mrs C. L., Lindfield, Marshall Road, Godalming, Surrey.
Wilkinson, John, B.Sc., c/o Hartley Botanical Laboratories, The University, Liverpool, 3.
Wilkinson, J. S., 26 Golder's Rise, Hendon, N.W.14.
†Wilkinson, Miss W., Hewell Grange, Redditch, Worcs.
Willan, Mrs Hugh, Underhill House, Shorncliffe, Kent.
Williams, Mrs Frances R., 234 Highland Avenue, Winchester, Mass., U.S.A.
Williams, I. A., West Hall, Kew Gardens, Surrey.
Williams, M. L., The Elms Cottage, Colwall, Malvern.
†Wilmott, A. J., M.A., F.L.S., Dept. of Botany, British Museum (Nat. History), Cromwell Road, S.W.7.
Wilson, A., F.L.S., Tir-y-coed, Ro Wen, Conway.
†Wilson, A. K., 13 Wolfreton Villas, Springhead, Hull.
Winter, W. P., B.Sc., F.G.S., 6 Grange Avenue, Saltaire, Yorks.
Winton, Miss M. de, Glencree, Lansdown Road, Cheltenham.
*†Wolley-Dod, Lt.-Col. A. H., Berkeley Cottage, Mayfield, Sussex.
Woodhead, J. E., B.Sc., F.I.C., Ph.C., 15 Kennington Palace Court, Sancroft Street, S.E.11.
Woodhead, Norman, M.Sc., Dept. of Botany, University Coll. of N. Wales, Bangor.
Worsdell, W. C., A.L.S., 11 Westbourne House, Twickenham, Middlesex.
†Wright, Dr F. R. Elliston, Braunton, N. Devon.

Yeoman, Miss Ruth, The Green, Brompton, Northallerton, Yorks.
York Public Library, City of, York.
Young, Rev. A. J., Seamark, Lloyd Road, Hove, Sussex.
Young, Miss Gertrude, 5 Woodlands Terrace, Glasgow, C.3.
Yuill, Edward, Chingford, Askham Lane, Acomb, York.

ACCOUNTS FOR THE YEAR 1938.

GENERAL FUND.

To Balance from 1937,	£180	12	0	By Insurance,	£0	6	0
,, Subscriptions for 1938 (£187 17s 0d); paid in advance (£29 10s),	217	7	0	,, Printing (other than Reports), Stationery, & Binding,	30	0	1
,, Excursion Fees,	1	5	0	,, Printing Reports,	145	12	0
,, Sales of Reports and Reprints,	1	4	6	,, Expenses of Distributor,	1	9	5
				,, Honorarium to Secretary,	25	0	0
				,, Excursion Expenses,	0	16	3
				,, Postage & Petty Expenses (Secretary),	13	2	9
				,, Balance,	184	2	0
	£400	8	6		£400	8	6

PUBLICATIONS FUND.

To Balance from 1937,	£126	3	10	By Balance,	£137	7	4
,, Sales of Comital Flora and Plant List, etc.,	11	3	6				
	£137	7	4		£137	7	4

LIFE MEMBERS' FUND.

To Balance from 1937,	£144	8	0	By Deposit with P.O. Savings Bank,	£ 21	0	0
				,, Balance,	123	8	0
	£144	8	0		£144	8	0

Miss TROWER'S FUND.

To Balance from 1937,	£16	7	11	By Balance,	£16	7	11

BENEVOLENT FUND.

To Balance from 1937,	£41	3	6	By Balance,	£41	3	6

BALANCE-SHEET AT 31st DECEMBER 1938.

General Fund,	£184	2	0	500 National Savings Certificates, at cost,	£400	0	0
Publications Fund,	137	7	4	Cash at Bank,	102	8	9
Life Members' Fund,	144	8	0	Post Office Savings Bank Deposit (Life Members' Fund),	21	0	0
Miss Trower's Fund,	16	7	11				
Benevolent Fund,	41	3	6				
	£523	8	9		£523	8	9

(Signed) Francis Druce, Hon. Treasurer.

14th February 1939.—Examined and found correct.

(Signed) H. W. Pugsley, Hon. Auditor.

SUMMARY OF PROCEEDINGS OF MEETINGS.

A meeting of the Committee was held on November 16th, 1938, at which it was decided that the Editorial Sub-Committee should draft a letter for publication in *The Gardeners' Chronicle* expressing the views of the General Committee with regard to an article in the *Bulletin of the Alpine Gardens Society* drawing attention to native British Alpines.

It was resolved to invite the Association for the Study of Systematics in relation to General Biology to call a conference of biologists to define more precisely the boundaries of the Watsonian vice-counties in order to obtain uniformity of records in the various branches of Biology. A Sub-Committee consisting of Mr J. E. Dandy, Mr J. E. Lousley, Mr A. J. Wilmott, and the Hon. Editor were appointed to represent the Society at this Conference.

The report of the Excursions Sub-Committee on the 1938 Excursions was received and approved and a list of proposals for 1939 Excursions was submitted and approved.

At a meeting of the Committee on March 15th, 1939, Mr H. W. Pugsley was re-appointed Hon. Auditor and Mr N. D. Simpson was appointed Distributor to the Exchange Club for 1939.

Mrs Foggitt was asked to make the arrangements for the Conversazione to take place at the Great Central Hotel, London, on Wednesday, November 15th.

Mr Hall raised the matter of the Society's publications—the *British Plant List* and *The Comital Flora*—and said that while he had been informed that there was an ample stock of the former still available, the stock of the latter would soon be exhausted. In view of this position, the Editorial Sub-Committee were of the opinion that it seemed desirable to make a start on a new edition of *The Comital Flora*, and it was proposed by Dr Ramsbottom, seconded by Mr Druce, that the recommendation of the Editorial Sub-Committee be adopted.

It was resolved on the proposition of Mr Pugsley, seconded by Mr Sandwith, that the Honorary Secretary should send out a post-card on the 1st January drawing the attention of members to Rule 3c regarding nominations for the four annual vacancies on the Committee.

Mr J. S. L. Gilmour was co-opted to the Committee.

The Editorial, Excursions, and Rules Sub-Committees were appointed for the ensuing year. Mr J. E. Lousley was elected to represent the Society on the Phenological Committee of the Meteorological Society.

At the Annual General Meeting on the same date 37 members were present, and the meeting was presided over by the Chairman, the Rt. Hon. H. T. Baker.

The Honorary Secretary's and Honorary Treasurer's reports were adopted, and the Officers for the Society were elected as enumerated on p. 5.

A vote of thanks to the Linnean Society of London for allowing the Society to use their Rooms was passed.

Mr P. M. Hall read a paper entitled "The British Species of *Utricularia*," which is printed in an extended form below. The paper was illustrated by numerous specimens from Mr Hall's collection and from the Druce Herbarium and by maps showing the distribution of the species in Britain as at present known.

REPORT OF THE HONORARY SECRETARY FOR 1938.

The favourable increase in the Society's membership recorded in my two previous reports has not been maintained in 1938. The number of new members is 22 (the same as in 1937), but after taking into account 16 resignations, 5 deaths and 6 whose membership lapsed under Rule 6(d), the nett result is a decrease of 5 in the total membership.

It is with regret that I record the death of the following members in 1938: Sir Maurice Abbot-Anderson, Mrs Godden, Mr F. J. Hanbury, Mrs Perrycoste and Sir Sidney Peel. Mr Hanbury joined the Society in 1883, and for many years took an active interest in the Exchange Club.

The Committee, having received requests for some form of lecture at one of the Society's meetings, arranged for a paper of botanical interest to be read at the conclusion of business at the Annual General Meeting. Should this meet with members' approval and support, it is hoped to maintain it as an annual event.

1938 was a year of greater activity on the part of members and the number of specimens sent in for identification and verification was considerably larger than in previous years. Now that the Society has obtained the services of a complete panel of Referees, it is hoped that members will co-operate in providing them with the desiderata they require as set forth in the Supplement to the last B.E.C. Report.

The excursions held during 1938 were well attended, and an account of them, with a summary of the proceedings of meetings, will appear in the Distributor's Report.

As in previous years, the Society is deeply indebted to the Linnean Society for being allowed the use of their rooms during the year; to the authorities of the British Museum (Natural History), and of the Royal Botanic Gardens, Kew; and to the Referees and many others for their continued and willing help.

OBITUARIES.

Sir Maurice Abbot-Anderson, C.V.O., M.B., B.S., M.R.C.S. (1861-1938). By the death of Sir Maurice Abbot-Anderson on May 3rd, 1938, the cause of Wild Plant Conservation in Britain lost one of its foremost advocates, and many botanists a kindly and honoured friend.

Sir Maurice was born in 1861 and educated at University College, London, and at Durham. He took up a medical career with very distinguished success and amongst the many important appointments which he held at various times he was honoured with that of honorary physician to the late Princess Royal (Duchess of Fife).

His interest in botany dated from youth, but his busy professional life allowed little leisure and it was not until retirement that his hobby could be fully indulged. In 1925, after considerable preliminary discussion, he founded Flora's League, The Society for the Protection of Wild Flowers, Ferns, and Trees, which was intended, mainly by the means of propaganda amongst children and the general public, to reduce thoughtless destruction of our flora. In this field the efforts of the founder enjoyed very considerable success, and the League is to be carried on as a fitting memorial to its first President who had its objects so very much at heart.

Sir Maurice's efforts in the cause of the protection of wild flowers helped to pave the way for the formation of the Wild Plant Conservation Board, which he later represented on the Council of the Society for the Preservation of Rural England. He was also a member of the National Trust, the Council for the Preservation of Rural Wales, and the Association for the Preservation of Rural Scotland.

His work in this connection was greatly strengthened by a most remarkable facility for sympathising with those whose views were not identical with his own, and for understanding their arguments, and even at times modifying important contentions of his own when adequate reasons had been produced that this was desirable. In this manner, aided by a most lovable nature, he was often able to win support for his cause even from his critics.

Sir Maurice's character is best described as that of the most perfect type of an English gentleman. Kindly in word, thought, and deed, he always sought to avoid hurting the feelings of his fellow creatures, and this character was never more in evidence than when he was dealing with people who were socially inferior to himself. His delightful house at Lyme Regis was a Mecca to which many flower lovers were invited, and whence they returned with happy memories of a perfect host.

J. E. Lousley.

More detailed notices will be found in the "Times" for May 4th, 1938, and "Countryside," xi, 308, Autumn 1938, to which the writer is indebted for several facts.—J.E.L.)

Donald Alexander Haggart (1850-1939). Very many botanists, especially of the older generation, will regret to hear of the death, at the age of 89, of Donald Alexander Haggart, who died on the 15th of January 1939 at Grandtully Cottage, Aberfeldy. Mr Haggart's family had a long connection with Loch Tayside district, going back for four or five generations. He himself was a banker in Killin for the greater part of his life. He was a very keen botanist and no one was more familiar with the flora of the Breadalbane mountains than he. He had been on the summit of Ben Lawers over 300 times. Being a tireless walker, he was always ready to take the hill with anyone of kindred interests. Many botanists, both past and present, owe their knowledge of the rarer Lawers plants to him. He was a friend of Druce, Marshall, Shoolbred, the Groves, the Lintons, Babington, and many others. The only wreath placed on Babington's coffin was one of *Saxifraga oppositifolio* sent by Haggart from Meall-nan-Tarmachan. Though he never possessed a microscope he knew the Bryophyta well and Stirton named a moss in his honour. The geology as well as the flora of the district attracted him and although he could not speak a word of German he had studied it so that he could read with ease the German literature on the subject. It is sad to record the death of such a kindly and interesting personality. R. H. C.

Frederick Janson Hanbury (1851-1938). Frederick Janson Hanbury, who was a member of the Society for many years, was born on May 27th, 1851, and died on March 1st, 1938. He was a grandson of Cornelius Hanbury, who had entered into partnership with William Allen in 1795 to found the famous firm of Allen & Hanbury. After serving his apprenticeship he entered the family business in 1872 and was Chairman from 1916 onwards.

He became interested in flowering plants at an early age and his contributions to the *Journal of Botany* commenced in 1871, while two years later a note stated he had begun to gather material for a Flora of Kent. For many years after this date he spent much of his leisure in investigating plants of that County and the *Flora of Kent* was published with the collaboration of the Rev. E. S. Marshall in 1897. He will be particularly remembered for his work upon *Hieracium*; he commenced to publish a monograph of the genus in 1889 but this was unfortunately never completed, only 8 parts being published, the last of them in 1898. The monograph is especially notable for the excellence of the coloured plates, most of which were drawn by his cousin, Miss Gulielma Lister.

Hanbury was also well known as a gardener and at East Grinsted he built a famous rock garden. The plants growing in this included a very representative collection of British natives.

Hanbury's herbarium and collection of *Hieracia* were bequeathed to the British Museum, South Kensington, to join Boswell-Syme's harbarium which Hanbury had already presented in 1932.

P. M. H.

Charles Waterfall (1851-1938). The Society has lost an old member and a contributor to the Exchange Club Distributions for many years in the death of Charles Waterfall. Born at Leeds on January 7th, 1851, he acquired an interest in botany at a very early age, possibly from Dr Christopher Johnson of Lancaster. Between 1896 and 1910 he was resident at Hull, and, a member of the Hull Scientific and

Field Naturalists' Club, he made numerous contributions to J. Fraser Robinson's *Flora of the East Riding of Yorkshire.* From 1910 until his death on January 26th, 1938, he lived at Chester. His herbarium has been presented to the Botanical Department of Sheffield University. E. S. Marshall named *Epilobium Waterfallii* (*E. hirsutum* L. × *palustre* L.) in his honour. P. M. H.

EDITORIAL NOTES.

Patrick M. Hall, Hon. Editor.

Some explanation may be necessary in connection with the separate publication of the two parts of the Report. Reference has been made by me already to the criticism of the late appearance of the Society's Reports and I feel strongly that our Reports lose some part of their value if they do not appear in time for use in the early part of the next collecting season. In order, therefore, to get this part of the Report issued earlier, it has been decided to publish the two parts of the Report independently, not waiting for the completion of the Distributor's Report and the Report on the 1938 Excursions, which will appear together later.

Even so, I feel that the present date of publication of Part I is much later than it should be. If the expedient now adopted meets with general approval it may be possible in another year to obtain the earlier publication which is so desirable. In extenuation I can only ask members to believe that the difficulties and delays which have to be overcome in editing the Reports are more considerable than one can realise until one actually experiences them, especially in such times as we have been through in recent months with all their attendant distractions.

Another feature of this year's Report is the complete absence of Reviews. This is a very regrettable state of affairs but it appears that publishers no longer send their new books to the Society's Officers for review, in consequence of the printing periodically of the complete list of members, to whom publishers send their prospectuses direct. It has also to be remembered that much material which might be classified under the heading " Reviews " does in fact appear in the Reports in the form of Abstracts.

As usual, I have to thank many members of the Society as well as the members of the Editorial Sub-Committee and Mr Chapple for much kind help during the past year.

Comital Flora. As there appears to be a steady sale for this book and the stock is nearly exhausted, the Committee, on the recommendation of the Editorial Sub-Committee, have instructed me to prepare for a second edition. In this the assistance of the Society's Referees will be sought and all members are invited to send to me particulars of corrections which have come to their notice in those areas or groups in which they are interested.

Plant Records. All records should give the following data:—

- (a) The specific (and, where applicable, varietal, etc.) name.
- (b) Locality and Watsonian vice-county (the county alone will not suffice).
- (c) Date.
- (d) Name of finder, if not the person submitting the record.
- (e) If the plant belongs to a critical group, the name of the expert by whom it was determined: if the plant has not been named by an expert, a specimen must be sent for determination. Records in critical groups will not be published unless this procedure has been complied with.
- (f) If material has been dried, the Herbarium in which it is kept, so that it may be traced if required for study.
- (g) Information as to the status of the plant (whether native, naturalised or casual), habitat, altitude, soil, etc., is desirable.

It is important that new vice-comital records should be supported by voucher material and members making such records are urged to deposit material in the herbarium of the Dept. of Botany, British Museum (Natural History), S. Kensington, or one of the other national or public herbaria.

PERSONALIA.

FLORA OF THE ISLES OF SCILLY.

Work on the Flora of these islands during 1938 has resulted in a number of very interesting records. Owing to the necessity of visiting the islands during every month of the summer, it is likely to be at least two years before publication of the full results. Members contemplating a visit to Scilly are invited to communicate with Mr J. E. Lousley, 7 Penistone Road, Streatham Common, London, S.W.16, beforehand in order that they may be supplied with lists of species which require verification. All records, even those of many common plants, will be appreciated if the island on which they are found is specified.

VALERIANA.

Dr K. B. Blackburn, King's College, Newcastle-on-Tyne, is studying the cytology of this genus and will be glad to receive material.

Professor J. R. Matthews, Department of Botany, University of Aberdeen, Aberdeen, will be glad to arrange to send to any Referee the material of any group in the Herbarium of Aberdeen University.

Mr G. H. Beale, of the John Innes Horticultural Institution, 31 Mostyn Road, Merton Park, S.W.19, is working on flower pigments and is collecting data of the occurrence in nature of colour variations of commonly occurring species. Members observing such variations should send a few flowers of both the typical and variant forms together with particulars of habitat and information as to the occurrence of any related species in the neighbourhood.

THE PROGRAMME OF EXCURSIONS.

arranged for 1939 was sent out to all members with the notices of the Annual General Meeting.

NOTICE.

THE 1939 CONVERSAZIONE

will be held at the Great Central Hotel, London, on Wednesday, November 15th, from 3 to 6 p.m.

Arrangements as in previous years. Tickets, price 3/6 per head, including tea, may be had on application to

Mrs Foggitt, Stoneybrough, Thirsk, Yorks.

Please enclose cheque or postal order, and stamps for reply. A few friends may be invited.

PLANT NOTES.

[In the case of direct contributions the name of the author of the Note is printed in small capitals. Where the name of the author is not in small capitals, and is coupled with a date (the name and date, or date alone, being bracketed), the Note is an Abstract, its origin being ascertainable by reference to the Bibliography.—Ed.]

32/11×10. **Fumaria micrantha** Lag. × **officinalis** L. 17, Surrey; Epsom College farm, A. E. Ellis, det. H. W. Pugsley.

54/14. Brassica arvensis (L.) Kuntze. According to Wheeler (1938) the valid name for *Sinapis arvensis* L. under *Brassica* is **B. haber** (DC.) Wheeler.

54/15. Brassica alba (L.) Boiss. Wheeler (1938) writes the name as "*B. alba* (L.) Rabenhorst," but says that the earliest available name is **Brassica hirta** Moench.

54/22. Brassica adpressa Bois. According to Wheeler (1938) the valid name for *Sinapis incana* L. is **Brassica geniculata** (Desf.) J. Ball.

66/2. **Teesdalia Lepidium** DC. In June 1938 I detected a small colony of what was assumed to be *T. nudicaulis* (L.) Br. on sandy ground behind Laig Bay, Isle of Eigg (104), and one plant was taken as a voucher. When it was examined in the laboratory, it appeared to be different from the ordinary form of *T. nudicaulis* found in Northumberland and was therefore submitted to Dr R. W. Butcher, who assigns it to the allied species, *T. Lepidium* DC.—J. W. Heslop Harrison. [According to Rouy and Foucaud, *Fl. Fr.*, *2*, 141 (1895) this species differs from *T. nudicaulis* in its shorter stems, linear-lanceolate, acute leaves, entire or pinnatifid with all lobes acute, the upper rarely slightly obtuse, flowers ordinarily with 4 stamens (6 in *T. nudicaulis*), and silicles smaller, orbicular, with no style. This species has a mediterranean distribution and in France occurs principally in the Midi and Corsica.—Ed.]

101/3c. Stellaria media L. var. **glaberrima** Beck, *Fl. v. Nied. Oesterr.*, *1*, 364 (1890). Plants destitute of hairs in all parts, including the internodes, from Nottingham (R. Bulley) are referred to this variety by C. E. Britton (*J.B.*, *76*, 23, 1938). Another form from the Hebrides is subglabrous, with the pubescence restricted to the internodes.

103. Sagina L. The characters and variation of the Scottish alpine Saginas are discussed by Elliston Wright (1938 A) and illustrated by 15 photographic plates and 2 text-figures. *Sagina nivalis* (Liljeb.) Liljeb. appears to have affinities with *S. maritima* Don but cytological research,

as yet incomplete, by Dr K. B. Blackburn, shows that the former species has the highest chromosome-count of any British *Sagina*, while that of the latter is much lower. Both *S. nivalis* and *S. saginoides* (L.) Dalla Torre are more variable than is generally supposed and several inaccuracies in text-book descriptions are pointed out. *S. saginoides* (including *S. scotica* Druce) may be distinguished from all other species by the shape of the petals, which are broad, almost orbicular, sometimes slightly emarginate. It is considered that *S. saginoides* and *S. scotica* are conspecific, the former being a plant of dry rocks at higher altitudes, while the latter is a plant of wet bare places at lower altitudes and is given the name, *S. saginoides* Dalla Torre forma *scotica* (Druce) Elliston Wright, "comb. nov." [Elliston Wright uses the name *S. caespitosa* Lange, which is incorrect. Our British plant has been erroneously identified with *S. caespitosa* (J. Vahl) Rink resulting in the further erroneous use of the name *S. caespitosa* Lange for it, whereas it is *S. nivalis* (Liljeb.) Liljeb. = *S. intermedia* Fenzl.—A.J.W.]

103/6. SAGINA BOYDII Buch.-White. The characters of this plant are described and illustrated from cultivated specimens by Elliston Wright (1938 B: 361-364), who considers the original more likely to have come from Aberdeenshire than from Switzerland and that it was probably not a chance mutation or a hybrid. The chromosome-count (Blackburn) is $2n = 22$, i.e. in the same group as *S. procumbens*, *S. subulata* and *S. saginoides*.

103/9. SAGINA REUTERI Boiss. Without actually seeing Spanish material Elliston Wright (1938 B: 364) believes the English plant to be that described by Boissier. The chromosome-count (Blackburn) is $2n = 12$, which puts it in the same group as *S. ciliata* and *S. apetala*. For three years English material of *S. Reuteri* from four separate localities has been under cultivation and with shelter, sufficient moisture and good soil all have developed into *S. ciliata*. The name **S. ciliata** Fr. forma **Reuteri** (Boiss.) Elliston Wright has therefore been given to this form.

194. ROSA L. The distribution of Roses in numerous Scottish Islands belonging to v.-cc. 100, 103, 104, 108 and 110 is described by Harrison and Bolton (1938).

194/201. ROSA SHERARDI Davies var. **Cookei** Heslop Harrison. 110, Outer Hebrides; several stations in the South of S. Uist, R. B. Cooke and J. W. Heslop Harrison. Described as a new variety—"clearly an endemic form of some importance"—with diagnosis but without designation of type by Harrison (1938).

216/2b. MYRIOPHYLLUM ALTERNIFLORUM DC. var. **americanum** Pugsl. Leaves only 3-5 mm. in length and segments measuring 2-4 mm., as compared with leaves 10-25 mm. long, and segments of 6-20 mm. in the typical form. Described by Pugsley (1938) as a new variety based on material collected in company with Dr R. Ll. Praeger in Lough Beg, August 1938. Dried material has also been seen from:—Lough Neagh, Antrim, July 13th, 1867, S. A. Stewart in Hb. Mus. Brit.; same locality and date, G. Dickie in Hb. Druce; Lough Ree, Co. Longford, June 28th, 1899, R. Ll. Praeger in Hb. Bennett (in Hb. Mus. Brit.).

No European material in Hb. Mus. Brit. or Hb. Kew matches this Irish form, although some Scandinavian gatherings approach it. N. American material in both these herbaria is uniform and identical with the Irish form, which is the prevalent, if not only, form of *M. alterniflorum* known in N. America, where it has been regarded as the typical species. The normal form occurs however in Greenland. The variety is figured by Britton and Brown, *Illustrated Flora of N. United States, Canada, etc.*, ed. 2, *2*, 615, fig. 3083 (1913). The addition of another plant common to the floras of Ireland and N. America is of great interest.

Praeger (1938) records the variety from all five counties bordering L. Neagh—Down, Antrim, Londonderry, Tyrone and Armagh; from Antrim and Londonderry bordering L. Beg; from Co. Longford, L. Ree, as above; and from " the other great limestone lake of the Shannon—L. Beg " [sic: is not this a misprint for L. Derg?—Ed.]. Typical *M. alterniflorum* is common in Ireland, especially in the acid waters of the west, but has not been seen in L. Neagh or L. Beg, where the water is alkaline, with a pH as high as 7. *M. spicatum* occurs in L. Neagh and in Ireland tends to be calcicole.

250/3. **Petroselinum crispum** (Mill.) Nym. is the correct name of the Common Parsley according to Airy-Shaw (1938 A), who lists three varieties:—(a) var. *crispum* (Mill.) Airy-Shaw, (b) var. *latifolium* (Mill.) Airy-Shaw and (c) var. *anatolicum* (Freyn & Sint.) Airy-Shaw.

283/3. CAUCALIS ANTHRISCUS (L.) Huds. Under *Torilis* the valid name for *Tordylium Anthriscus* L. is *Torilis japonicus* (Houtt.) DC.—Merrill (1938)

291/2c. LONICERA PERICLYMENUM L. var. **Clarki** Heslop Harrison. 110. Outer Hebrides: cliffs on Ben More, S. Uist, J. W. Heslop Harrison. Distinguished by its glabrous, subcoriaceous, elliptical, broad leaves. Described as a new variety with diagnosis but without designation of type by Harrison (1938: 117).

296/8. GALIUM DEBILE Desv. A description of this species, prepared from Devonshire specimens, is given by Britton (1938).

396. CIRSIUM Mill. The following three names are proposed by Airy-Shaw (1938 B).

396/2. **Cirsium vulgare** (Savi) Airy-Shaw. This combination must now be used for the Spear Thistle, since the combination *C. lanceolatum* (L.) Scop. (1772), based on *Carduus lanceolatus* L., is found to be a later homonym of *C. lanceolatum* Hill (1769). The latter was actually an illegitimate "new name" for *Carduus dissectus* L., and had no connection with *Carduus lanceolatus* L., but it invalidates the use of the same name for any other species.—H. K. A.-S.

396/3. **Cirsium helenioïdes** (L.) Hill. This name must be used for the Melancholy Thistle, since two forms of this species, described by Linnaeus as *Carduus heterophyllus* and *C. helenioïdes* (the latter Siberian), were united by Hudson (1778) under the latter name. As Hudson was the first to unite the two Linnean species, his choice of epithet must be followed, under Art. 56 of the International Rules. This rule applies, whether the species is retained in its original genus or transferred (as in this case) to another.—H. K. A.-S.

396/5. **Cirsium dissectum** (L.) Hill. The Meadow Thistle was long supposed to have been unaccounted for by Linnaeus, and has been generally known either as *Cirsium anglicum* (Lam., 1784) Lam. & DC. or as *C. pratense* (Huds., 1778) Druce—the latter being an illegitimate later homonym of *C. pratense* (Lam.) Lam. & DC. (1805). It is now shown that the much misunderstood *Carduus dissectus* L. (1753) was based on a figure and description by Lobel (1576) of a specimen of the Meadow Thistle from Gloucestershire, and therefore *Cirsium dissectum* (L.) Hill (1768) is the correct name for this species.—H. K. A.-S.

416/9. CREPIS FOETIDA L. This variable and polymorphic species is considered by Babcock (1938) to be a "Rassenkreis," originating from three species, which for taxonomic purposes are treated as three subspecies of *C. foetida* L., *sensu lato*. The British plant belongs to *C. foetida* L. subsp. **vulgaris** (Bisch.) Babcock, of which thirteen forms are listed with a geographical range covering Western, Central and Southern Europe to the Crimea, Asia Minor, Syria and S.W. Persia.

438/3. VACCINIUM VITIS-IDAEA L. Early and late flowering seasons of this species in 38, 57 and 88 are described by R. C. L. Burges, W. Watson and Miss M. S. Campbell (*J.B.*, *76*, 24, 1938).

467/2. ANAGALLIS ARVENSIS L. and 467/3. ANAGALLIS FOEMINA Mill. Schinz and Keller's subdivision of the species *A. arvensis* into two subspecies is followed by Marsden-Jones and Weiss (1938) in a study of the morphology and genetics of the two subspecies. These are 1. subsp. **phoenicea** (Scop.) Schinz and Keller, which includes five colour-varieties—scarlet, salmon, white, lilac and blue—and 2. subsp. **foemina** (Mill.) Schinz and Keller, which occurs in one colour only, "Grayish Violaceous Blue." Morphologically the subspecies differ considerably, especially in the shape and the margins of the petals, which are broadly ovate in subsp. *phoenicea* and entire or obscurely crenulate, while in subsp. *foemina* they are narrowly obovate and denticulate. The genetic behaviour of crosses within and between the subspecies is described.

467/2b. ANAGALLIS ARVENSIS L. var. CARNEA Schrank. This plant is generally treated in Floras as a colour-variety of *A. arvensis* with flesh-coloured flowers but Rilstone (*J.B.*, *76*, 85) considers it to have greater taxonomic importance than this. It has a neater habit than typical *A. arvensis*, with semi-upright stems and in Cornwall it is almost entirely a maritime plant: it nearly always occurs on sand-dunes, *cf.* Lousley, *B.E.C. 1936 Rep.*, 267, 1937 [also Hall and Simpson, *loc. cit.*—ED.]: where it does occur inland, it is due to the conveyance of dune sand to farm land for agricultural purposes.

Marsden-Jones and Weiss (1938: 147), however, treat var. *carnea* Schrank as a colour-variety of *A. arvensis* L. subsp. *phoenicea* (Scop.) Schinz and Keller.

558/6f. MENTHA PIPERITA L. var. SYLVESTRIS Sole. Still (1938) has modified his previous views (see abstract in *B.E.C. 1937 Rep.*, 455, 1938). The plant from which Fraser drew up his description of *M. hircina* Hull was not identical with Hull's plant. The identity of the latter with Sole's "*M. piperita sylvestris*" is confirmed: this plant seems to have been a local form occurring near Bath and is now possibly extinct. The specimen, now in Hb. Kew, from which Fraser drew up his description of *M. hircina* Hull, is a hairy form of *M. piperita* L. var. *subcordata* Fraser, while *M. hircina* Hull var. *hirsuta* Fraser is a similar form of *M. piperita* L. var. *officinalis* Sole. To the latter, "lusus *pilosus*," are referred the gatherings from Danehill, Aldborough, Bedwyn, Weston-in-Gordano and Fern Den, Angus.

558/9u. MENTHA VERTICILLATA L. var. **hylodes** Topitz, *Beihefte zum Bot. Centralblatt*, *30*, Abt. 2, 232 (1913). A weak but rather large form, with long petioles, large leaves tapering much to both ends and about equally, while the whorls are pedunculate. 36, Hereford; marshy coppice, Brockbury Farm, Colwall (*F. M. Day*). No doubt just one of the infinite number of hybrid forms but recognisable from Topitz' figure and description.—A. L. STILL.

588/10h. PLANTAGO MAJOR L. Mr F. T. Baker sent me a specimen of this species which had been collected in a Lincoln garden and matches the "variety" *bracteata* Druce. This is a morphological state and not a taxonomic variety. The whole plant is very large and coarse, with irregular serrate leaves, and with a spike nearly 30 cm. long, having enlarged foliaceous bracts in the lower part which gradually become normal towards the apex.—J. F. G. CHAPPLE.

633. ULMUS L. The view expressed by Stearn and Gilmour (*Kew Bull. 1933*, 503), that the name *Ulmus campestris* L. should be rejected as a *nomen ambiguum* under Art. 62 of the International Rules of Botanical Nomenclature, is supported by Melville (1938 C). Linnaeus was undoubtedly most familiar with *U. glabra* Huds. and this is the tree represented in his herbarium, but in his writings he appears to

have intended to cover all European elms with the one name *campestris*. This has resulted in later botanists in each country seeing Linnaeus' species in that with which they themselves were most familiar. The use of this name with different meanings for over a century has made it a permanent source of confusion and error.

633/6c. ULMUS STRICTA Lindl. var. **Goodyeri** Melville in *Journ. Bot.*, *76*, 185-192. "Goodyer's Elm." In the second edition of Gerard's Herbal, published in 1633 with T. Johnson as editor, John Goodyer was responsible for the descriptions of four elms, two of them then described for the first time. One of these, "Ulmus minor folio angusto scabro. The Narrow-leaved Elme," has been identified by Melville (1938 B) and described as above. The round-headed habit of the tree separates it markedly from typical *U. stricta*, which however it closely resembles in its leaves and branchlets. The habit of the tree, as well as various types of foliage, are illustrated by text-figures. It is found as a hedgerow tree in the coastal plain of south-west Hants, between Lymington, Christchurch and Ringwood.

652/2. EMPETRUM HERMAPHRODITUM (Lange) Hagerup. Doubt is expressed by Blackburn (1938 A) as to whether the true plant occurs in Britain following the discovery near Edmondbyers, Durham (66) of a hermaphrodite specimen of *E. nigrum* L. This was indistinguishable in vegetative characters from near-by male and female plants. When examined cytologically, it was found to have $n = 13$, whereas *E. hermaphroditum* should give $n = 26$.

668/5. EPIPACTIS RUBIGINOSA Crantz. The flowers of British specimens are usually less brightly coloured and the plants shorter than in S. France and Switzerland. In less arid situations, such as Arnside Knott and Newbiggin Crags, the plants agree with the Continental form in colour and size.—T. Stephenson (*J.B.*, *76*, 56).

669/4. ORCHIS SIMIA Lam. As a result of comparing the description in Godfery, *Monogr. and Iconogr. Nat. Br. Orch.*, 166 (1933), of *O. simia* Lam. var. *macra* (Lindl.) Godfery with a Kentish specimen found in 1923, Brooke (1938) advances the theory that there are two British forms of this species, "the true *O. simia*" in Kent and var. *macra* in Oxfordshire. [There are several points in this paper which call for more detailed comment than can be made in a note on an Abstract. Most of the material for a paper on the *Militares* section of *Orchis* has been collected for some time and the projected paper is overdue.—P.M.H.]

669/10 and 11. ORCHIS MACULATA L. (*sec.* Druce) and FUCHSII Druce. Hagerup (1938) uses the names "*O. maculatus* L." and "*O. maculatus* var. *genuinus* Reichb." for the tetraploid ($2n = 80$) species. He also refers to "var. *helodes*" as a tetraploid, but does not in this paper state the differences between *genuinus* and *helodes*. The only diploid ($2n = 40$) plant seen by him in Denmark is *O. maculatus* var. *Meyeri* Reichb. f., which from the illustration has a labellum shaped like that of *O. Fuchsii*. This "variety" occurs in one Danish locality "on almost pure limestone under *Fagus*." It is said to range from France to Scandinavia, "but everywhere as a rarity." Its most marked character, besides the shape of the labellum, is said to be its very broad lower leaves, a character shared by *O. Fuchsii* also a diploid. Vermeulen (1938) equates *O. maculata* L. var. *Meyeri* Reichb. f. with *O. Fuchsii* Druce.

Hagerup attributes to the polyploid nature of *O. maculata* (*genuina*) the following characteristics as compared with var. *Meyeri*:—(a) a wider geographical distribution: (b) a greater abundance of individuals: (c) capacity to tolerate drought, moisture and cold: (d) capacity to tolerate acidity of the soil: (e) longer and later flowering period: (f) smaller size.—P. M. Hall.

669/17c. Anacamptis pyramidalis (L.) Rich. var. **fudayensis** (Heslop Harrison) P. M. Hall, comb. nov. "*Orchis pyramidalis* var. *Fudayensis* var. nov." Heslop Harrison, *The Vasculum*, *24*, No. 4, 116-117 (1938).

110, Outer Hebrides; Island of Fuday, J. W. Heslop Harrison. In this variety described by Harrison (1938: 117) the inflorescence is said to be elongated to a length of 8 cm. or over, cylindrical in outline instead of pyramidal but it is stated that "more normal plants were also encountered there."—P. M. Hall.

719/9. **Luzula luzuloides** (Lam.) Dandy and Wilmott, "comb. nov.," in *Journ. Bot.*, *76*, 352-353. This combination is based on *Juncus luzuloides* Lam. in *Encycl. Méth. Bot.*, *3*, 272 (1789) and reasons for adopting it in place of *L. albida* (Hoffm.) DC. and *L. nemorosa* (Pollich) E. Mey. are given by Dandy and Wilmott (1938).

723/1(2). **Arum neglectum** (Towns.) Ridley. *A. italicum* Mill. var. *neglectum* Townsend in *Fl. Hants.*, 327 (1883) [=723/1c. of *B.P.L.*, *ed. 2*]. *A. italicum* Mill. var. *immaculatum* Rouy, *Fl. de France*, *13*, 279 ("probably") [=723/1b. of *B.P.L.*, *ed. 2*]. *A. italicum* auct. brit. *non* Miller. This new combination is made by Ridley (1938), who gives a detailed description and considers the plant to be specifically distinct from *A. italicum* Mill., lacking the white leaf-venation of the latter and having other differences in the shape of leaf and spathe. In addition the upper sterile organs are fewer than in *A. italicum* and papillose, the bare spaces above and below the male flowers are much longer, the ovaries are globose-obconic not oblong, the fruit-spike is usually shorter and the seeds less numerous, 1-2 compared with 2-4. Plants with spotted leaves are considered to be hybrids with *A. maculatum*. Records are cited from v.-cc. 1-4, 9, 10, 11, [12!—P.M.H.], 13, 15, 41 ["Curtynalu" should read "Cwrtyala."—P.M.H.]; also recorded from Jersey, Guernsey, Alderney and N. France. All British localities with the exception of those in 11 [and 12 and 13 (Arundel Park).—P.M.H.] are stated to be within one mile of the sea.

737/23×27. POTAMOGETON BERCHTOLDII Fieb. × TRICHOIDES Cham. & Schlecht. = × *P. franconicus* Hagström. Two Surrey gatherings have been referred to var. *spicosus* Hagström of this hybrid:—(1) by Hagström himself, from Hedge Court Mill Pond, September 28th, 1879, and September 12th, 1886, Beeby; (2) by A. Bennett, from Ewood Pond, July 1884, Beeby (wrongly ascribed by Bennett to Straker). Dandy and Taylor (1938 B) find that there is no justification for ascribing a hybrid origin to either gathering, which both agree in all respects with *P. trichoides*.

737/24. POTAMOGETON RUTILUS Wolfg. This species has been much confused by British authorities with other species. Details of these erroneous identifications are given by Dandy and Taylor (1938 C). *P. rutilus* is allied to *P. Friesii* and *P. pusillus*, having closed, tubular, stipular sheaths. It is altogether more slender than *P. Friesii* and from *P. pusillus* it may be distinguished by the firmer texture of the stipular sheaths, which are more strongly nerved and more persistent, tending to become fibrous, and are tubular only towards their base. Hagström's statement that this species occurred in N. America has been disputed by Fernald who pointed out that Hagström had confused it with an endemic American species.

737/27. POTAMOGETON TRICHOIDES Cham. & Schlecht. The characters by which this species may be distinguished from narrow-leaved forms of *P. pusillus* and *P. Berchtoldii*, with which they have been confused in the past, are given by Dandy and Taylor (1938 B). *P. pusillus* is separated from the other two species by its closed, tubular, stipular sheaths, while *P. trichoides* and *P. Berchtoldii* both have convolute, open, stipular sheaths but may be separated by their leaf-venation. In the latter the midrib is bordered, at least towards the base, by one or more rows of lacunae and the two lateral nerves are evident, while in *P. trichoides* the midrib is relatively thicker and more prominent and usually without a border of lacunae and the lateral nerves are so faint as to be often hardly visible. *P. trichoides* has a tendency to monocarpy and in comparison with the other two species the fruits are larger and are usually somewhat muriculate along the dorsal keel.

The British distribution of this species has been thoroughly reviewed (see p. 62 below). The species may be commoner in Britain than has been supposed and should be looked for wherever *P. pusillus* occurs as the two species favour similar ecological conditions.

737/27b. POTAMOGETON TRICHOIDES Cham. & Schlecht. var. TRIMMERI Caspary. This variety was described by Caspary in *Journ. Linn. Soc., Bot.*, *8*, 273 (1865), from material received from K. Trimmer from Framlingham Earl, E. Norfolk. After examining a large series of *P.*

trichoides Dandy and Taylor (1938 B) conclude that the variety is untenable, since the muriculations on the dorsal keel of the fruit, on which the variety is based, are variable in degree of development and are an unsatisfactory diagnostic character.

753/14. CAREX CAPILLARIS L. forma MAJOR Blytt. The view expressed by Mr Wilmott in *B.E.C. 1936 Rep.*, 229-230 (1937), that this form is of no taxonomic value, is supported by a specimen gathered on Meall Ghaordie (88) in July 1938. This specimen had attached to it a stem of the 1937 growth, 2.5 dm. in length, whereas the growth of the current year on the same plant was no more than 0.8-1.2 dm. in length.—P. M. HALL.

753/49m. CAREX GOODENOWII Gay var. HEBRIDENSIS (Ar. Benn.) Wilmott. *C. spiculosa* Fr. var. *hebridensis* Ar. Benn. The new combination made by Wilmott (1938) was referred to in *B.E.C. 1937 Rep.*, 459 and 555-556 (1938). Duncan's plant, on which Bennett's variety was based, was an extreme narrow-glumed form of *C. Goodenowii* without any trace of the excurrent midrib to be expected in a variety of *C. spiculosa*. Connecting links occur between typical *C. Goodenowii* and the narrow-glumed form.

827/19×19(2). **Bromus hordeaceus** L. × **lepidus** Holmberg. Plants growing with the presumed parents were determined by C. E. HUBBARD as probably this hybrid from :—3, S. Devon; roadside, E. Prawle, *B.E.C. Excursion*. 23, Oxon.; waste ground, Manor Road, Oxford, J. P. M. BRENAN: waste ground, Jackdaw Lane, Oxford, J. F. G. CHAPPLE.

829/4×1. **Lolium multiflorum** Lam. × **perenne** L. Plants have been determined by C. E. HUBBARD as probably this hybrid from :—23, Oxon.; waste ground, Jackdaw Lane, J. F. G. CHAPPLE. 32, Northants.; Brampton Ash, 1921, A. E. ELLIS.

830/1. AGROPYRUM JUNCEUM (L.) Beauv. Simonet and Guinochet (1938) describe and discuss the geographical distribution of two subspecies :—*A. junceum* (L.) Beauv. subsp. *boreo-atlanticum* and *A. junceum* (L.) Beauv. subsp. *mediterraneum* which differ not only in their chromosome numbers, $2n = 28$ and $2n = 42$ respectively, but also in their morphological characters. The British plant is subsp. **boreo-atlanticum**. See also Pardi (1937).

851/6. ASPLENIUM FONTANUM (L.) Bernh. The specimens of *Polypodium fontanum* in the Linnean herbarium do not represent the plant known as *Asplenium fontanum* but are *Woodsia glabella*, while the diagnosis in *Spec. Plant.*, ed. i, is also ambiguous. Taylor (1938) argues that there are weightier reasons for retaining the specific epithet in *Asplenium* than for transferring it to *Woodsia* and selects the plant in Burser's herbarium, identified by Linnaeus as his *Polypodium fontanum*, as the lectotype.

872/6c. NITELLA MUCRONATA Miq. var. **heteromorpha** Kützing. Characterized by the fertile whorls forming dense heads, whereas in the normal form the growth is uniformly lax. 14, E. Sussex; reservoir at Scolescombe, near Hastings, August 1937, D. F. Leney ex Allen (1938. 49).

876/16. **Chara globularis** Thuill. This name is adopted in place of *C. fragilis* Desv. by Allen (1938: 50).

PLANT RECORDS.

* = New vice-county record. † = Not native in this locality.

Note.—Where these signs are used at the beginning of a paragraph containing more than one record, they refer to the first record only. In the case of direct contributions, the name of the contributor is printed in small capitals. In the case of records which are Abstracts, the author's name and date, or the date alone, are enclosed in brackets. In every case where no date is printed, it is to be understood that the record refers to 1938.

1/1. Clematis vitalba L. 13, W. Sussex; Lodsworth and S. Ambersham, hedges on sandy soil, E. C. Wallace.

†4/1. Adonis annua L. 61, S.E. Yorks.; Wilson (1938: 4): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 58, 1902, for previous record.

6/24. Ranunculus heterophyllus Weber. 39, Staffs.: Alton, R. W. Butcher.

*6/27. Ranunculus sphaerospermus Boiss. & Blanch. 8, S. Wilts.; Teffont Magna, J. D. Grose, det. R. W. Butcher.

6/33e. Ranunculus Ficaria L. var. bulbifera Marsden-Jones. 11, S. Hants.; lane N. of Whitedell Farm, Fareham, P. M. Hall. 36, Hereford; Colwall, locally plentiful in several places, F. M. Day.

†10/1. Eranthis hyemalis (L.) Salisb. 26, W. Sussex; Boxted, locally abundant in a wood, A. E. Ellis.

†13/3. Delphinium gayanum Wilmott. 61, S.E. Yorks.: Kelsey Hill, Burstwick, 1936, H. J. Davis; King George Dock, Hull, 1932-1935, A. K. Wilson (Wilson: 1938: 4, as *D. Ajacis* L.); add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 61, 1902, for previous record.

21/5. Papaver Argemone L. 30, Beds.: Bromham, J. G. Dony.

*†22/1. Meconopsis cambrica (L.) Vig. 78, Peebles; naturalized by the Newhall Burn, P. M. Hall.

*†24/1. Roemeria hybrida (L.) DC. 61, S.E. Yorks.; Hull Docks [probably *c.* 1902], C. Waterfall ex Wilson (1938: 5).

†25/1. Chelidonium majus L. 43, Radnor; lane, Gladestry, W. H. Hardaker.

†28/1b. Eschscholtzia californica Cham. var. **crocea** (Benth.) Jepson, *Fl. Calif.*, *1*, 570 (1922). Alien, California. 41, Glamorgan; Cardiff, R. L. Smith and A. E. Wade, see p. 74 below.

*31/1. Corydalis claviculata (L.) DC. 8, S. Wilts.; Castle Wood, Gasper, Stourton, J. D. Grose.

32. Fumaria L. Determined by H. W. Pugsley.

32/1b. Fumaria capreolata L. var. Babingtonii Pugsl. 5, S. Somerset; Doniford, near Watchet, A. E. Ellis and J. R. Parsons.

32/5. Fumaria Boraei Jord. 36, Hereford; field between road and the Leech Pool, Clifford, P. M. Hall.

32/8. Fumaria Martinii Clav. 17, Surrey; Kingswood, near Chipstead, A. E. Ellis. [Add to *C.F.*: see *B.E.C. 1914 Rep.*, *114* (1915) and Salmon, *Fl. Surrey*, 118 (1931) for previous Surrey records.—Ed.]

*32/9. Fumaria Bastardi Jord. 23, Oxon.; Kidlington, N. E. G. Cruttwell.

32/10d. Fumaria officinalis L. var. Wirtgenii Hausskn. 17, Surrey; Epsom College farm, A. E. Ellis. 30, Beds.; Leagrave, J. G. Dony.

*†32/11. Fumaria micrantha Lag. 61, S.E. Yorks.; Hull Docks, 1902, C. Waterfall ex Wilson (1938: 5) [not det. H. W. Pugsley].

†33/2. Matthiola sinuata R. Br. 61, S.E. Yorks.; Wilson (1938: 5): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 64, 1902, for previous record.

†33/6. Matthiola oxyceras DC. 3, S. Devon; Churston Ferrers, Galmpton, G. T. Fraser.

35/2. Rorippa sylvestris (L.) Smith. 27, E. Norfolk; Abbot's Hall, Aylsham, A. E. Ellis. 37, Worcs.; waste ground near Kidderminster, W. H. Hardaker. 42, Brecon; Afon Llynfi, N. of Three Cocks Junction, P. M. Hall and E. C. Wallace. *82, E. Lothian; Longniddry, Miss W. Wilkinson.

35/4. Rorippa islandica (Oeder) Schinz & Thell. 17, Surrey; Epsom sewage farm, A. E. Ellis.

*†36/2. Barbarea verna Aschers. 38, Warwick; roadside, Gray's Mellory, J. P. M. Brenan and J. F. G. Chapple.

†36/5. Barbarea intermedia Bor. 15, E. Kent; field near Harty Church, Sheppey, J. E. Lousley. *†61, S.E. Yorks.; Hull Docks, 1903, C. Waterfall ex Wilson (1938: 5).

†42/6. ALYSSUM ALYSSOIDES L. 11, S. Hants.; S. Hayling, introduced with shoddy, J. STALEY, comm. P. M. HALL.

†42/9. BERTEROA INCANA (L.) DC. 28, W. Norfolk; near Stanford's Belt, Thetford, 1936, A. E. ELLIS.

*43/4. DRABA MURALIS L. 55, Rutland; old walls, Glaston, 1933, S. A. TAYLOR. *59, S. Lancs.; Walton, 1811, J. Shepherd ex Stansfield (1938: 15).

†49/2. SISYMBRIUM SOPHIA L. 65, N.W. Yorks.; Tanfield Mill, Miss C. M. ROB.

†49/4. SISYMBRIUM ORIENTALE L. 11, S. Hants.; S. Hayling, introduced with shoddy, J. STALEY, comm. P. M. HALL. †17, Surrey; Epsom, waste ground on sewage farm, A. E. ELLIS. †23, Oxon.; Burford, J. P. M. BRENAN. †25, E. Suffolk; Felixstowe Docks, Miss W. WILKINSON. †36, Hereford; Lower Vinesend, Cradley, F. M. DAY.

†49/5. SISYMBRIUM IRIO L. 61, S.E. Yorks.; Hull Docks, 1902, C. Waterfall ex Wilson (1938: 6): add to *C.F.* and see *B.E.C. 1918 Rep.*, 368, 1919, for previous record.

49/6b. SISYMBRIUM OFFICINALE (L.) Scop. var. LEIOCARPUM DC. 3, S. Devon; Elbury Farm, Churston Ferrers, F. M. DAY.

†52/1. CAMELINA SATIVA Crantz. 16, W. Kent; Chiselhurst, 1874, HB. EPSOM COLL., comm. A. E. ELLIS. [Add †15 and †16 to *C.F.*, see Hanbury and Marshall, *Fl. Kent*, 36 (1899).—ED.] †61, S.E. Yorks.; Wilson (1938: 6): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 68, 1902, for previous record.

*†54/1. BRASSICA OLERACEA L. 61, S.E. Yorks.; Hull Docks, 1933, A. K. Wilson (1938: 7).

*†54/13. SINAPIS NIGRA L. 61, S.E. Yorks.; King George Dock, Hull, 1934, A. K. Wilson (1938: 7).

†54/16. BRASSICA JUNCEA Coss. 37, Worcs.; Puxton tip, Kidderminster, W. H. HARDAKER.

55/1. DIPLOTAXIS TENUIFOLIA (L.) DC. 54, N. Lincs.; Immingham Docks, H. B. WILLOUGHBY SMITH.

55/2b. DIPLOTAXIS MURALIS (L.) DC. var. CAULESCENS Kittel. 41, Glamorgan; shore near Sker, Miss E. VACHELL.

†55/3. DIPLOTAXIS ERUCOIDES (L.) DC. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

*†61/3. Lepidium Draba L. 9, Dorset; common on Weymouth backwater and other waste places, Miss V. M. Leather. †30, Beds.; Marslets, J. G. Dony. †61, S.E. Yorks.; Wilson (1938: 7): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 70, 1902, for previous record.

†61/8. Lepidium perfoliatum L. 25, E. Suffolk; Felixstowe Docks, J. E. Lousley.

†61/28. Lepidium bonariense L. 37, Worcs.; Puxton tip, Kidderminster, W. H. Hardaker.

*64/4. Thlaspi calaminare Lej. & Court. 104, Rhum; in some quantity in two distinct stations in the mountains in the west of the island: when collected it was at once referred to this species but, when recorded in *Journ. Bot.*, *77*, 5 (January 1939), it was assigned to the aggregate *T. alpestre* L.: Dr R. W. Butcher has confirmed the original determination.—W. A. Clark.

†73/1. Euclidium syriacum (L.) R. Br. 34, W. Gloucester; casual, Avonmouth Docks, new to the Bristol alien flora, Mrs C. I. and N. Y. Sandwith.

†74/2. Bunias orientalis L. 39, Staffs.; Burton-on-Trent, R. C. L. Burges.

†87(2). **Cistus** L., *Sp. Pl.*, 523 (1753); *Gen. Pl.*, ed. 5, 234 (1754).

†87(2)/1. **Cistus salviifolius** L., *Sp. Pl.*, 524 (1753). 3, S. Devon; one bush on roadside bank, near Newton Abbot, L. A. W. Burder, det. Kew.

88. Viola L. Determined by P. M. Hall.

88/3c. Viola sylvestris Lam. var. leucantha Čelak. 36, Hereford; Purlieu Lane, Colwall, F. M. Day.

88/4b. Viola Riviniana Reichb. var. diversa Greg. 36, Hereford: Tarrington Common (very near f. *minor* Murb.—P.M.H.), F. M. Day.

88/4c. Viola Riviniana Reichb. forma minor Murb. 37, Worcester: Kempsey Common, F. M. Day.

88/6×4. Viola canina L. × Riviniana Reichb. 9, Dorset; Maiden Castle, S. A. Taylor. 36, Hereford; Tarrington Common, F. M. Day.

88/8g. Viola odorata L. var. sulfurea (Cariot) Rouy & Foucaud. 36, Hereford; The Winnings garden, Colwall, F. M. Day. [First found many years ago and recently rediscovered: there is no record of its having been planted.—F.M.D.]

92/3. Dianthus Armeria L. 6, N. Somerset; walls of Bruton Churchyard, F. K. Makins. [Add to *C.F.*: see *Top. Bot.*, *Supp. 1*, for previous record.—Ed.]. 9, Dorset; near Wool, R. Good.

†108/1. Claytonia alsinoides Sims. 41, Glamorgan; plantation at St Fagan's, well established, Miss Wilkinson, comm. Miss E. Vachell. *†61, S.E. Yorks.; Birdsall House, 1933, R. D'O. Good ex Wilson (1938: 9, as *C. sibirica* L.).

†108/2. Claytonia perfoliata Donn. 61, S.E. Yorks.; Wilson (1938: 9): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 79, 1902, for previous record. *†74, Wigtown; near Ardwell Mill, Stonykirk, W. A. P. Sprott.

†112/3. Hypericum hircinum L. 11, S. Hants.; lane, Fritham, Mrs R. C. Ashby: hedge near Lymore, Lady Davy and Mrs J. V. Phelps.

†115/3. Althaea rosea L. 17, Surrey; Epsom, casual on sewage farm, A. E. Ellis.

†116/2. Lavatera cretica L. 61, S.E. Yorks.; Wilson (1938: 9): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 81, 1902, for previous record.

†116/10. Lavatera punctata All. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

†125/1. Linum angustifolium Huds. 7, N. Wilts.; casual, Old Swindon, J. D. Grose. [Add to *C.F.*; see *Marlb. Coll. N.H.S. 1894 Rep.* for previous record as *L. bienne* Mill. Also add to *C.F.* †8, S. Wilts.; see Preston, *Fl. Wilts.*, 60, 1888.—J.D.G.]

127/1. Geranium sanguineum L. Whilst investigating recently the flora of Coll (103), I rediscovered this plant in the original station mentioned by MacCulloch (1818) in his "Description of the Western Islands of Scotland." In connection with this record, it should be noted that in Vol. I, p. 140, of the same work he reports the species as occurring on the Machair of N. Uist. Obviously, as he correctly recorded and described the species from Coll, there can be no misidentification in this case. Thus we have to recognise what, in view of the neglect of this reference of MacCulloch's, is practically a N.C.R. of *G. sanguineum* L. for v.-c. 110.—W. A. Clark.

*†127/2. Geranium versicolor L. 36, Hereford; lane near Kinnersley Castle, W. H. Hardaker.

†127/5. Geranium phaeum L. 73, Kirkcudbright; roadside 8½ m. W. of Dumfries, W. A. P. Sprott.

*†127/6. Geranium Endressi Gay. 23, Oxon.; damp spinney, Heythrop, Lady Roche. *†37, Worcs.; verge of Hagley Wood between Halesowen and Hagley, W. H. Hardaker.

127/8. GERANIUM COLUMBINUM L. 23, Oxon.; a very rampant and straggling form near Chadlington, Lady ROCHE.

127/11. GERANIUM ROTUNDIFOLIUM L. 23, Oxon.; allotments, Stonesfield, R. C. L. BURGES.

127/13. GERANIUM LUCIDUM L. 92, S. Aberdeen; Craig Leek, Braemar, at 1500 ft., J. G. ROGER, comm. C. LEIGHTON HARE.

*†133/3. IMPATIENS PARVIFLORA DC. 27, E. Norfolk; garden weed, Abbot's Hall, Aylsham, A. E. ELLIS. †37, Worcs.; near Bewdley, W. H. HARDAKER. [Add 37 to *C.F.*: see *B.E.C. 1923 Rep.*, 179 (1924), for earlier record.—ED.]

*†133/4. IMPATIENS GLANDULIFERA Royle. 95, Moray; banks of R. Lossie, Arthur's Bridge, Lossiemouth, J. E. LOUSLEY, R. C. L. BURGES and J. W. CARDEW.

†142/3. ACER PLATANOIDES L. 17, Surrey; Leatherhead Downs, naturalized in plantations and hedges, many self-sown young trees, A. E. ELLIS.

†152/14. TRIGONELLA ARABICA Delile. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†153/1. MEDICAGO FALCATA L. 25, E. Suffolk; Felixstowe Docks, J. E. LOUSLEY: Miss W. WILKINSON.

†153/8. ×MEDICAGO VARIA Martyn. 25, E. Suffolk; Felixstowe Docks, in numerous colour forms, J. E. LOUSLEY.

†153/19. MEDICAGO TUBERCULATA Willd. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

*155/8. TRIFOLIUM SQUAMOSUM L. 59, S. Lancs.; North Shore, Liverpool, 1811, J. Shepherd ex Stansfield (1938: 15).

†155/34b. TRIFOLIUM ECHINATUM M. Bieb. var. **resupinatum** (Schinz & Keller) Aschers. & Graebn. 9, Dorset; replanted wood by north lodge of Sherborne Park, 1937, R. D'O. GOOD, det. KEW.

†160/6. LOTUS TENUIS (L.) Waldst. & Kit. 54, N. Lincs.; Immingham Docks, H. B. WILLOUGHBY-SMITH.

†163/1. GALEGA OFFICINALIS L. 41, Glamorgan; riverside near St Fagan's, Hon. G. CHARTERIS.

†169/2. SCORPIURUS SUBVILLOSUS L. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†169/4b. **Scorpiurus muricatus** L., *Sp. Pl.*, 745 (1753) var. **laevigatus** (Sibth. & Smith) Boiss. Reg. Medit. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†172/3. HIPPOCREPIS UNISILIQUOSA L. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†173/3. ONOBRYCHIS CAPUT-GALLI Lam. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†174(2)/1. ARACHIS HYPOGAEA L. 16, W. Kent; High Brooms Tip, J. P. M. BRENAN and N. D. SIMPSON.

†176/6. VICIA DASYCARPA Ten. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†176/9. VICIA LUTEA L. 41, Glamorgan; Roath, Cardiff, Miss E. VACHELL. *†61, S.E. Yorks.; Hull Docks [probably *c.* 1902], C. Waterfall ex Wilson (1938: 11).

†176/21. VICIA CALCARATA Desf. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

176/33(3). **Vicia eriocarpa** (Hausskn.) Halácsy, *Consp. Fl. Graec.*, *1*, 489 (1900). Alien, S.E. Europe. 41, Glamorgan; Cardiff, R. L. SMITH and A. E. WADE, det. KEW (see p. 77 below.—ED.).

†178/1. LATHYRUS LATIFOLIUS L. 17, Surrey; Epsom, waste ground on sewage farm, A. E. ELLIS. *†61, S.E. Yorks.; Hull Docks [probably *c.* 1902], C. Waterfall ex Wilson (1938: 11).

*†178/3. LATHYRUS TUBEROSUS L. 9, Dorset; cornfield, Dorchester, Miss ANGLE, comm. Miss V. M. LEATHER.

†178/17. LATHYRUS ANNUUS L. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

†180/3. PISUM HUMILE Boiss. & Noë. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

*†183/4. PRUNUS CERASUS L. 100, Arran; 9 small trees among Ash, Alder, etc., between road and stream near Lamlash village: status doubtful, known here for at least 30 years but thought not to have been planted: fruit produced very sparingly: flowering freely in May 1937, R. MACKECHNIE.

*†184/10. SPIRAEA SALICIFOLIA L. 92, S. Aberdeen; near Aberdeen, Miss KERR, comm. A. H. WOLLEY-DOD.

†185/38. Rubus laciniatus Willd. 30, Beds.; Clophill, J. G. Dony. 88, Mid Perth; naturalized near Lochearnhead, Miss M. Stewart, comm. Miss U. K. Duncan.

185/67. Rubus vestitus Weihe. 57, Derby; Via Gellia, S. A. Taylor, det. Wm. Watson.

185/112. Rubus pallidus Weihe. 55, Rutland; Empingham Woods, S. A. Taylor, det. Wm. Watson.

†189/4. Potentilla argentea L. 61, S.E. Yorks.; Wilson (1938: 12): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 99, 1902, for previous record.

189/5. Potentilla Crantzii Beck. 92, S. Aberdeen; on the S.
c/ side of Graig Mhor (1 mile N. of Balmoral Castle), at 1000-1100 ft., J. G. Roger, comm. C. Leighton Hare.

†189/17. Potentilla intermedia L. 9, Dorset; Weymouth railway yards, 1934, N. D. Simpson. 82, E. Lothian; Longniddry, Miss W. Wilkinson.

190. Alchemilla L. Determined by A. J. Wilmott except where indicated.

*190/2. Alchemilla pratensis Schmidt. 49, Caernarvon; on made earth of an artificial conduit which brings water from Llyn Cowlyd for the power station at Dolgarrog, Conway Valley, May 1925, C. Raymond Baker. 62, N.E. Yorks.; Low Horcum, P. M. Hall and W. A. Sledge. 75, Ayr; near Woodland, 1937, A. J. Wilmott. 94, Banff; Birchfield, Glen Avon, E. F. Warburg. *96, Easterness; banks of Spey, Aviemore, 1922, C. E. Salmon, det. Jaquet (1924): Larig Ghru and near South Kinrara, near Aviemore, E. F. Warburg. *104, N. Ebudes; near Flodigarry, Skye, 1936, A. J. Wilmott. H.33, Fermanagh; N. of Drumcose: H.34, E. Donegal; limestone pasture near Ballintra, E. F. Warburg. [Irish Records. *C.F.* gives only H.39, Antrim, but Praeger (1934: 506) gives H.9, 15, 17, 18, 21-25, 27-31, 33, 34, 36, 38, 39.—Ed.]

190/4. Alchemilla minor Huds. 104, N. Ebudes; Quiraing, Skye, 1936, A. J. Wilmott; Raasay, 1937, R. B. Cooke. *109, Caithness; Latheron, 1935, A. J. Wilmott.

*190/10. Alchemilla glomerulans Buser. 93, N. Aberdeen; near the river between Edinglassie and Huntly, A. H. G. Alston. *97, Westerness; Mam Sodhail range, 1936, A. J. Wilmott.

191/2. Agrimonia odorata Mill. 36, Hereford; Limbridge Hill Wood, F. M. Day. *78, Peebles; between road and R. Tweed opposite Cardrona, P. M. Hall and W. A. Sledge.

†193/5. Poterium canadense A. Gray. 88, Mid Perth; bed of R. Tay, Taymouth Castle, Carleton Rea. 89, E. Perth; left bank of R. Tay below Perth, Miss C. M. Rob.

*194/23. Rosa spinosissima L. 8, S. Wilts.; Lavington Sands, J. D. Grose.

†195/9. Sorbus intermedia (Ehrh.) Pers. 61, S.E. Yorks.; Wilson (1938: 12): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 102, 1902, for previous record.

†211/8. Sedum micranthum Bast. 41, Glamorgan; grass sward on outcrop of limestone, Cwm Alun, near Bridgend, in fair abundance: this plant was recorded from this habitat by Principal Trow in the *Flora of Glamorgan*, as "looking like a native and certainly so different from *S. album* as to merit specific rank," and in this habitat deserves more notice than it has received.—Miss E. Vachell.

216/3b. Myriophyllum verticillatum L. var. pectinatum (DC.). 27, E. Norfolk; Buckenham, A. E. Ellis.

220. Epilobium L. Determined by G. M. Ash.

220/3×10. Epilobium hirsutum L. × montanum L. 16, W. Kent; Tonbridge, J. P. M. Brenan.

*†220/6. Epilobium Lamyi F. Schultz. 61, S.E. Yorks.; King George's Dock, Hull, 1937, Miss C. M. Rob.

†220/7(2). Epilobium adenocaulon Hausskn. 16, W. Kent; Tonbridge, J. P. M. Brenan. [This restores the record for v.-c. 16, the previous record having been cancelled in *B.E.C. 1937 Rep.*, 479 (1938).—Ed.] †17, Surrey; bank of R. Wey, Pyrford: Epsom, sewage farm, A. E. Ellis. †23, Oxon.; two plants in a gravel-pit, Cassington, J. F. G. Chapple.

220/9. Epilobium lanceolatum Seb. & Maur. 15, E. Kent; sandpit, Aylesford, J. P. M. Brenan and N. D. Simpson. 17, Surrey; near Marepond Farm, Hascombe, A. E. Ellis.

†223(2). **Godetia** Spach, *Hist. Vég. Phan.*, *4*, 386 (1835).
†223(2)/1. **Godetia viminea** Spach, *op. cit.*, 388. Alien, California. 41, Glamorgan; Cardiff, R. L. Smith and A. E. Wade, see p. 78 below.

†224(3). **Lopezia** Cav., *Ic.*, *1*, 12 (1791).
†224(3)/1. **Lopezia coronata** Andr., *Bot. Rep.*, *8*, *t.* 551 (1808). Native of Mexico. 23, Oxon.; Jackdaw Lane, Oxford, J. P. M. Brenan.

*245/3. Bupleurum rotundifolium L. 53, S. Lincs.; cornfield near Monk's Wood, Carlby, Mrs C. L. Wilde.

†245/4. Bupleurum opacum Lange. 61, S.E. Yorks.; Wilson (1938: 13): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 111, 1902, for previous record.

†245/6. Bupleurum lancifolium Hornem. 23, Oxon.; garden weed, Headington, Mrs Blackburn.

*248/1. Cicuta virosa L. 59, S. Lancs.; Allerton, 1822, J. Shepherd ex Stansfield (1938: 14).

†249/1. Ammi majus L. 17, Surrey; among lucerne in orchard, Epsom College, 1933, A. E. Ellis.

*†250/3. Petroselinum crispum (Mill.) Airy-Shaw. 61, S.E. Yorks.; Wilson (1938: 14).

†252/1. Falcaria vulgaris Bernh. 23, Oxon.; near Chadlington, Lady Roche. †38, Warwick; pasture, Wilmcote, near Stratford, W. H. Hardaker.

253/2. Sium erectum Huds. 30, Beds.; Bromham, J. G. Dony.

†263/1. Foeniculum vulgare Mill. 61, S.E. Yorks.; Wilson (1938: 14): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 114, 1902, for previous record.

†278/2. Tordylium aegyptiacum Lam. 34, W. Gloucester; casual, Avonmouth Docks, new to the Bristol alien flora, Mrs C. I. and N. Y. Sandwith.

†279/1. Coriandrum sativum L. Add 61, S.E. Yorks. to distribution recorded in *B.E.C. 1936 Rep.*, 258-259 (1937); see Wilson (1938: 14) and Robinson, *Fl. E. Riding Yorks.*, 116, 1902.

†283/1. Caucalis heterophylla L. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

†283/2b. Caucalis daucoides L. var. muricata (Bisch.) Gren. & Godr. 34, W. Gloucester; several plants among the typical form at Avonmouth Docks, Mrs C. I. and N. Y. Sandwith. [For notes on this variety and its previous occurrence near Avonmouth see *B.E.C. 1925 Rep.*, 772-774 (1926).—N.Y.S.]

283/5b. Caucalis nodosa (L.) Scop. var. pedunculata (Rouy & Fouc.) Druce. 6, N. Somerset; Uphill, J. P. M. Brenan.

†283/8. Caucalis latifolia L. 61, S.E. Yorks.; Wilson (1938: 14): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 116, 1902, for previous record.

287/3. Sambucus Ebulus L. 36, Hereford; Ledbury, in great plenty in the field next to the rubbish-tip, F. M. Day.

287/2c. Sambucus nigra L. var. viridis Ait. (=var. *leucocarpa* Koch). 63, S.W. Yorks.; one plant in an Elder hedge at Horbury, 1915: the berries remain green until ripe, when they turn white like white currants, P. H. Cooke.

296/2×9. Galium Mollugo L. × verum L. 38, Warwick; between Wilmcote and Billesley, W. H. Hardaker.

296/8. Galium debile Desv. Britton (1938) accepts records of this species from 3, 11 and Jersey only.

*†296/12b. Galium Vaillantii DC. 61, S.E. Yorks.; Hull Docks [probably *c.* 1902], C. Waterfall ex Wilson (1938: 15).

†301/4. Valeriana pyrenaica L. 39, Staffs.; in wood by stream, Oakamoor, R. W. Butcher.

304/1b. Valerianella olitoria Poll. var. lasiocarpa Reichb. 41, Glamorgan; near Sker, 1937, Miss Rawlins, det. and comm. Miss E. Vachell.

*†304/2. Valerianella eriocarpa Desv. 61, S.E. Yorks.; Hull Docks [probably *c.* 1902], C. Waterfall ex Wilson (1938: 15).

†307/3. **Cephalaria elata** (Hornem.) Schrad. ex Roem. & Schultes, *Syst.*, *3*, 51 (1818). 61, S.E. Yorks.; roadside between South Cave and Elloughton, 1937, A. N. Peak ex Wilson (1938: 15). [Mr B. L. Burtt of Kew informs me that the name formerly used for this plant—*C. tatarica* (L.) Schrad.—is invalid, being based on *Scabiosa tatarica* L., which is a species of *Knautia*.—Ed.]

308/5b. Scabiosa arvensis L. var. integrifolia Coulter. 64, Mid West Yorks.; Wharfedale, A. Turner.

320/2. Erigeron acris L. 8, S. Wilts.; masonry of canal-lock, W. of Crofton, P. M. Hall, J. D. Grose and E. C. Wallace. 17, Surrey; Cheam, walls at Nonsuch Park: a scarce plant in N. Surrey away from the chalk downs, E. C. Wallace. 67, S. Northumberland; Amble, plentiful in disused shipyard, M. E. Urton (*Vasc.*, *24*, No. 1, 34).

†320/3. Erigeron canadensis L. 25, E. Suffolk; plentiful as a weed, Southwold and Beccles, F. M. Day. *†56, Notts.; clover field S. of Gainsborough, J. F. G. Chapple and N. D. Simpson.

*326/1. Antennaria dioica (L.) Gaertn. 7, N. Wilts.; Morgan's Hill, Calstone Wellington, near Calne, Miss M. Horsell, Miss E. S. Todd and J. D. Grose.

†339/4. AMBROSIA TRIFIDA L. 17, Surrey; waste ground, Clandon crossroads, E. C. WALLACE and A. L. STILL. †69, N. Lancs.; chicken run, Ash House, Broughton-in-Furness, Hon. M. CROSS.

†339/4b. AMBROSIA TRIFIDA L. var. INTEGRIFOLIA (Willd.) Torr. & Gray. 62, N.E. Yorks.; Topcliffe Mill, Miss C. M. ROB.

†341/3. XANTHIUM SPINOSUM L. 11, S. Hants.; S. Hayling, introduced with shoddy, J. STALEY, comm. P. M. HALL. †25, E. Suffolk; Felixstowe Docks, J. E. LOUSLEY.

†354/1. GALINSOGA PARVIFLORA Cav. 37, Worcs.; Broadwater tip, Kidderminster, W. H. HARDAKER.

†354/2b. **Galinsoga quadriradiata** Ruiz & Pav., *Syst. Veg.*, 198 (1798) var. **hispida** (DC.) Thell., "Über die in Mitteleuropa verkommenden Galinzoga formen" in *Allgem. Bot. Zeitschrift, 21,* 1-16 (1915); Hegi, *Ill. Fl. v. Mittel-Europa*, Band VI, 523 (1918); Mosseray, *Bull. du Jard. Bot. de l'Etat, Bruxelles, 14,* fasc. 3, 324-327 (1937). *G. aristulata* Bickn., *Bull. Torrey Bot. Club*, 270 (1916). Also forma **Vargasiana** (Thell.) Mossery, *loc. cit.* Aliens, S. Amer., from Mexico to Chile. For records in Britain see p. 94 below.

†365/11(2). **Achillea alpina** L., *Sp. Pl.*, 899 (1753). Russia. 61, S.E. Yorks.; King George Dock, Hull, 1934, A. K. Wilson (1938: 16).

378/1. ARTEMISIA ABSINTHIUM L. 39, Staffs.; Oakamoor, R. W. BUTCHER.

†378/20. **Artemisia macrantha** Ledeb., *Mém. Acad. Pétersb., 5,* 573 (1805). Siberia. 61, S.E. Yorks.; King George Dock, Hull, 1936, A. K. Wilson (1938: 17).

†380/2. PETASITES ALBUS (L.) Gaertn. 39, Staffs.; in wood by stream, Oakamoor, R. W. BUTCHER.

†380/3. PETASITES FRAGRANS Presl. 16, W. Kent; near the Church, Lamberhurst, L. R. WALLIS.

†383/7. SENECIO SQUALIDUS L. 34, W. Gloucester; Avonmouth Docks, a form with the heads either rayless or with extremely short obscure rays, unmatched in the national herbaria, Mrs C. I. and N. Y. SANDWITH. *†36, Hereford; railway station yard, Colwall, F. M. DAY. [This is the first record for this species immediately to the west of the Malvern Hills: hitherto it has failed to penetrate the Tunnel.—F.M.D.] *†61, S.E. Yorks.; Hull Docks, from 1926, Wilson (1938: 17).

†383/8. SENECIO VISCOSUS L. 11, S. Hants.; railway embankment, between 4 and 5 miles south of Winchester, increasing, Miss F. C. BROMET, comm. P. M. HALL. †16, W. Kent; roadside between Lamber-

hurst and Pembury, 1936-7, L. R. Wallis. †17, Surrey; Epsom, waste ground on sewage farm, A. E. Ellis. 25, E. Suffolk; sandy places on coast, Walberswick Marsh, 1933, F. M. Day. †37, Worcs.; Broadwater tip, Kidderminster, W. H. Hardaker.

†383/10e. Senecio vulgaris L. var. radiatus Trow. 37, Worcs.; Hoo Brook tip, Kidderminster, W. H. Hardaker.

†383/23. Senecio inaequidens DC. 37, Worcs.; turnip field, Hartlebury, W. H. Hardaker.

†385/1. Calendula officinalis L. 17, Surrey; Epsom, casual on sewage farm, A. E. Ellis.

†389/2. Echinops Ritro L. 17, Surrey; Epsom, casual on sewage farm, A. E. Ellis.

396/1b. Cirsium eriophorum (L.) Scop. var. britannicum Petrak. 30, Beds.; Chambers Odell, J. G. Dony.

396/3. Cirsium helenioides (L.) Hill. 80, Roxburgh; foot of Minto Crags, Miss P. Leake.

†397/1. Onopordon Acanthium L. 30, Beds.; Barton, J. G. Dony.

†399/1. Silybum Marianum Gaertn. 37, Worcester; Castlemorton, F. M. Day. [Add to *C.F.*: see Amphlett and Rea, *Fl. Worcs.*, 213 (1909) for previous record.—Ed.]

401/1. Saussurea alpina (L.) DC. 97, W. Inverness; Coire Leis, Ben Nevis, very sparingly at head of corrie, E. C. Wallace.

†405/15. Centaurea Calcitrapa L. 61, S.E. Yorks.; Wilson (1938: 18): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 133, 1902, for previous record.

†405/20. **Centaurea cheiranthifolia** Willd., *Phytog.*, 12 (1794). *C. axillaris* Willd., *Sp. Pl.*, *3*, 2290 (1804). Caucasus. 61, S.E. Yorks.; Kelsey Hill, Burstwick, 1935, F. Singleton ex Wilson (1938: 18).

†405/31. Centaurea solstitialis L. 25, E. Suffolk; Felixstowe Docks, Miss W. Wilkinson. †54, N. Lincs.; Blyton, H. B. Willoughby-Smith.

†405/32. Centaurea melitensis L. 65, N.W. Yorks.; Tanfield Mill, Miss C. M. Rob.

†407/1. Carthamus lanatus L. 6, N. Somerset; waste ground, Bristol, 1937, Mrs C. I. Sandwith. [A form with pure white flowers, matching *Sintenis* No. 1957, from the Transcaspian region, in Hb. Kew. Apparently as yet without a name.—N. Y. Sandwith.] †65, N.W. Yorks.; Tanfield Mill, Miss C. M. Rob.

†407/3b. CARTHAMUS TINCTORIUS L. var. INERMIS Schweinf. 16, W. Kent; Tonbridge, J. P. M. BRENAN.

†407/5. **Carthamus oxyacantha** M. Bieb., *Casp. App.*, 198 (1800); *Fl. Taur. Cauc.*, *2*, 283 (1808); Boiss., *Fl. Orient.*, *3*, 709 (1875). Alien, Orient: has occurred as an adventive at Port Juvenal, France. 34, W. Gloucester; casual, Avonmouth Docks, Mrs C. I. SANDWITH.

410/1. ARNOSERIS MINIMA (L.) Schw. & Koerte. 12, N. Hants.; Yateley, J. B. L. STILLWELL, comm. P. M. HALL.

†412/1. RHAGADIOLUS EDULIS Gaertn. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. CHAPPLE.

416/3. CREPIS BIENNIS L. 17, Surrey; hayfield, Hascombe, A. E. ELLIS. 41, Glamorgan; near Bridgend, on field borders and hedgebanks in great profusion for ¼ mile on both sides of main road, usually very rare in Glamorgan, Miss E. VACHELL. 62, N.E. Yorks.; Topcliffe, Miss C. M. ROB.

*†419/7. HIERACIUM STOLONIFERUM Waldst. & Kit. 38, Warwick; railway bank, Hannington, W. H. HARDAKER.

419/179. HIERACIUM SURREJANUM Hanb. 13, W. Sussex; bank of lane near Bedham Hill, P. M. HALL and E. C. WALLACE, det. H. W. PUGSLEY.

421/1. HYPOCHAERIS GLABRA L. 12, N. Hants.; sandy field at East end of Fleet Pond, G. WATTS.

421/2c. HYPOCHAERIS RADICATA L. var. LEIOCEPHALA Regel. 6, N. Somerset; Beacon Hill, near Oakhill, J. R. PARSONS, comm. A. E. ELLIS.

†425/1. LACTUCA VIROSA L. 17, Surrey; garden weed, Balham Epsom sewage farm, A. E. ELLIS.

†425/2. LACTUCA SERRIOLA L. 17, Surrey; Beddington Park, near Croydon: Drift Bridge, Epsom, A. E. ELLIS. *†61, S.E. Yorks.; King George Dock, Hull, 1935-1937, A. K. Wilson (1938: 18).

†428/1. TRAGOPOGON PORRIFOLIUS L. 16, W. Kent; stone crossing below Dartford, one plant, evidently from seed blown from the other bank of the Thames where it is abundant, P. H. COOKE.

†428/6. TRAGOPOGON HYBRIDUS L. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES.

432/1c. JASIONE MONTANA L. var. LATIFOLIA Pugsl. H. 6, Waterford; sea-cliffs near Waterford, Mrs HUTTON, comm. Lady DAVY.

433/1. Wahlenbergia hederacea (L.) Reichb. Former occurrences in 20, Herts. and 28, W. Norfolk are referred to by Salisbury (1938: 70).

435/2. Campanula latifolia L. 28, W. Norfolk; Congham, near Hillington, A. E. Ellis.

435/4. Campanula rapunculoides L. 38, Warwick; abundant in pastures and meadows, Wilmcote, near Stratford, W. H. Hardaker. *97, Westerness; in a hay field on sandy soil near coast, Morar, Miss M. Stewart, comm. Miss U. K. Duncan.

*†435/6. Campanula persicifolia L. 61, S.E. Yorks.; introduced, East Park, Hull [probably *c.* 1902], C. Waterfall ex Wilson (1938: 18).

*†435/8. Campanula patula L. 61, S.E. Yorks.; King George Dock, Hull, 1933, F. Singleton ex Wilson (1938: 19).

†437/1. Trachelium caeruleum L. 54, N. Lincs.; Boston, F. T. Baker.

†443/2. **Gaultheria procumbens** L., *Sp. Pl.*, 895 (1753). Alien, N. Amer. 97, Westerness; Glen Garry, Ralston, det. and comm. W. B. Turrill: "growing in an open wood, the floor of which has little vegetation and is composed of pine needles. The patch gave every indication of having been in position for several years. The site is many miles from any garden."

444/1. Andromeda polifolia L. 67, S. Northumberland; Boddle Moss, G. Swan, comm. G. W. Temperley (*Vasc.*, *24*, No. 1, 34).

†446/7. Erica vagans L. 61, S. Yorks.; Wilson (1938: 19): add to *C.F.* and see *B.E.C. 1923 Rep.*, 198, 1922, for previous record.

*†449/1. Dabeocia cantabrica K. Koch. 11, S. Hants.; appeared spontaneously by footpath outside Ampfield Church, H. T. White, comm. P. M. Hall.

453/3. Pyrola minor L. 80, Roxburgh; Minto, Miss P. Leake.

463/2b. Lysimachia vulgaris L. f. angustifolia C. E. Salmon. 41, Glamorgan; Blackweir, Cardiff, Miss E. Vachell.

†463/3. Lysimachia punctata L. 12, N. Hants.; roadside near Fleet, G. Watts.

*465/1. Trientalis europaea L. 59, S. Lancs.; Formby, 1818, J. Shepherd ex Stansfield (1938: 15).

†467/2. Anagallis arvensis L. subsp. phoenicea. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

468/1. Centunculus minimus L. 12, N. Hants.; east end of Fleet Pond, G. Watts.

472/1. Ligustrum vulgare L. 33, E. Gloster; Swinley Green, Forthampton, F. M. Day.

477/1. Blackstonia perfoliata L. 13, W. Sussex; Shoreham (not on chalk), L. A. W. Burder.

478/4. Centaurium pulchellum (Swartz) Druce. 3, S. Devon; Idestone, near Exeter, A. E. Ellis.

480/6. Gentiana anglica Pugsl. 8, S. Wilts.; White Sheet Hill, P. M. Hall.

482/1. Nymphoides peltatum (S. G. Gmel.) Rendle & Britten. [4, N. Devon; pond in a disused quarry two miles from Bideford, Miss L. E. Richards: discovered by G. T. Fraser to have been "sown" there by a former owner.] 17, Surrey; Basingstoke Canal, W. Byfleet, A. E. Ellis

†489/1. Heliotropium europaeum L. 23, Oxon.; Jackdaw Lane, Oxford, J. P. M. Brenan.

491/1. Cynoglossum officinale L. 37, Worcester; Castlemorton, F. M. Day.

497/2. Symphytum tuberosum L. 37, Worcs.; North wood between Bewdley and Ardley, rarely flowering, W. H. Hardaker.

†497/4. Symphytum peregrinum Ledeb. 28, W. Norfolk; roadside, Guist, A. E. Ellis.

†500/1. Anchusa sempervirens L. 16, W. Kent; Lamberhurst church-yard, L. R. Wallis.

†500/2. Anchusa officinalis L. 25, E. Suffolk; roadside, Wenhaston (garden escape), F. M. Day.

506/1c. Myosotis scorpioides L. em. Hill var. laxiflora (Reichb.). 16, W. Kent; by a backwater of the Teise, J. R. Wallis, det. A. E. Wade, who says: "I have seen Reichenbach's specimens, which suggest that this is little more than a form of var. *memor* Kittel."

*506/2. Myosotis brevifolia C. E. Salmon. 64, Mid West Yorks.; West End, Blubberhouses, Miss C. M. Rob, confirmed by A. E. Wade.

506/3. Myosotis repens G. & D. Don. 65, N.W. Yorks.; Ilton near Masham, Miss C. M. Rob.

509/1. Echium vulgare L. 36, Hereford; Colwall, in a field on the site of a bonfire, F. M. Day.

*†509/2. Echium plantagineum L. 61, S.E. Yorks.; King George Dock, Hull, 1933, A. K. Wilson (1938: 20).

†513/5. **Convolvulus pentapetaloides** L., *Syst.*, ed. xii, 229 (1768). Alien, E. Europe; Asia Minor. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

†522/1. Datura Stramonium L. 11, S. Hants.; clearing in wood, Westend, Mrs R. C. Ashby. †27, E. Norfolk; garden weed, Abbot's Hall, Aylsham, A. E. Ellis. †37, Worcs.; Broadwater tip, Kidderminster, W. H. Hardaker.

†524/1. Hyoscyamus niger L. 3, S. Devon; garden weed, Crediton, A. E. Ellis.

†527/7. Verbascum Lychnitis L. 16, W. Kent; casual, Willingham, Dartford, P. H. Cooke.

†532/10. Linaria dalmatica Mill. 36, Hereford; bank of R. Teme, Leintwardine, Miss F. Pitt ex A. A. Dallman (*NW.Nat.*, *13*, No. 3, 167).

534/2. Antirrhinum Orontium L. 41, Glamorgan; arable land, Horton, Miss Simons, comm. Miss E. Vachell.

†534/3. **Antirrhinum Asarina** L., *Sp. Pl.*, 860 (1753). Alien, Pyrenees. 23, Oxon.; wall of Christ Church, Oxford (probably garden escape), G. Haynes, det. R. Melville.

†537/1. Mimulus guttatus DC. 16, W. Kent; naturalized beside a backwater of the Teise near Lamberhurst, L. R. Wallis.

†537/1d. Mimulus guttatus DC. var. Younganus (Hook.) Druce. 78, Peebles; naturalized by Newhall Burn, P. M. Hall.

†537/2. Mimulus moschatus Dougl. 93, N. Aberdeen; ditchbank by road, Edinglassie, Mrs C. I. Sandwith, A. H. G. Alston and N. Y. Sandwith.

543/9. Veronica aquatica Benq. 27, E. Norfolk; Gillingham Marshes: 33, E. Gloster; Swinley Green, Forthampton: *37, Worcester; Pinn's Green; F. M. Day. [Add 27 to *C.F.*: see *B.E.C. 1921 Rep.*, 391 (1922), for previous record.—Ed.]

543/9b. Veronica aquatica Benq. var. anagalliformis Boreau. 37, Worcester; Longdon Marsh, F. M. Day.

543/10. VERONICA ALPINA L. 97, W. Inverness; Coire Leis, Ben Nevis, very sparingly at head of corrie, but more plentiful on Aonach Beag, E. C. WALLACE.

†543/41. VERONICA FILIFORMIS Smith. 14, E. Sussex; in three places about Alfriston, J. E. LOUSLEY. †37, Worcs.; naturalized on the banks of the Severn, N. of Leachford Ferry near Holt Fleet, W. H. HARDAKER.

545. EUPHRASIA L. Determined by H. W. PUGSLEY.

545/5b. EUPHRASIA NEMOROSA (Pers.) Löhr var. COLLINA Pugsl. 9, Dorset; Studland Heath, R. C. L. BURGES. 54, N. Lincs.; chalk-pit near Gainsborough, H. B. WILLOUGHBY-SMITH. 55, Rutland; Empingham Woods, S. A. TAYLOR.

545/12b. EUPHRASIA FRIGIDA Pugsl. var. LAXA Pugsl. 92. S. Aberdeen; Lochnagar at 2500 ft., R. C. L. BURGES.

545/16b. EUPHRASIA SCOTICA Wettst. var. PURPURASCENS Pugsl. H. 28, Sligo; bog N.W. of Seafin, J. P. M. BRENAN and N. D. SIMPSON.

545/18. EUPHRASIA CONFUSA Pugsl. forma ALBIDA Pugsl. 11, S. Hants.; roadside near Holmsley station, P. M. HALL and A. J. WILMOTT. H. 20, Wicklow; Brittas Bay, R. C. L. BURGES.

*545/19(3). EUPHRASIA RIVULARIS Pugsl. 70, Cumberland; Honister Pass, Mrs C. I. and N. Y. SANDWITH.

545/21. EUPHRASIA PSEUDO-KERNERI Pugsl. forma ELONGATA Pugsl. 27, E. Norfolk; boggy places, E. Ruston, 1922, A. E. ELLIS.

*548/5. RHINANTHUS STENOPHYLLUS Schur. 93, N. Aberdeen; moorland and roadside, Edinglassie, near Huntly, Mrs C. I. SANDWITH, N. Y. SANDWITH and A. H. G. ALSTON. 95, Elgin; Culbin Sands, E. F. WARBURG. *100, Clyde Isles; salt marsh, Ardmaleish, Bute. 1928, A. E. ELLIS. Det A. J. WILMOTT.

548/6. RHINANTHUS MONTICOLA (Stern.) Druce. 97, W. Inverness; moorland near Fort William, E. C. WALLACE, and by path up Ben Nevis, 1929 and 1937, A. J. WILMOTT.

549/3a. MELAMPYRUM PRATENSE L. var. TYPICUM Beck forma LAXUM Beauv. 13. W. Sussex; bank of lane near Bedham Hill, P. M. HALL and E. C. WALLACE, det. C. E. BRITTON.

551/1. LATHRAEA SQUAMARIA L. 30, Beds.; Clophill, J. G. DONY. 40, Salop; Bowhills Dingle, W. H. HARDAKER.

552/2. UTRICULARIA NEGLECTA Lehm. 12, N. Hants.; in stream on East side of Fleet Pond, G. WATTS.

*552/3. Utricularia intermedia Hayne. 59, S. Lancs.; Litherland, 1820, J. Shepherd ex Stansfield (1938: 15). Add 67, S. Northumberland to *C.F.*: see *Fasc.*, *12*, 2, for earlier record: there are specimens from bog near Craglake in Hb. Winch in Hb. Brit. Linn. Soc. Lond.—P. M. Hall. *100, Arran; Glen Catacol, 1936, R. Mackechnie.

552/5. Utricularia minor L. 12, N. Hants.; in stream on East side of Fleet Pond, G. Watts. 43, Radnor; Rhôs Goch Common, P. M. Hall and E. C. Wallace.

†556/8. **Verbena hispida** Ruiz & Pav., *Fl. Per.*, *1*, 22, *t*. 34 (1798). Native of S. America, Peru to Central Chile. 23, Oxon.; Jackdaw Lane, Oxford, J. P. M. Brenan and J. Chapple.

558. Mentha L. Determined by A. L. Still.

*558/2. Mentha alopecuroides Hull. 9, Dorset; Swanage, R. C. L. Burges. *16, W. Kent; near Lamberhurst, L. R. Wallis. [Recorded for 15 in *C.F.*, but if this is based on the mention made by Sole in *Menthae Britannicae* (1798), repeated in *E.B.*, ed. 3—and I can trace no other record—it should be deleted.—J. F. G. Chapple.] 25, E. Suffolk; Southwold: Holton: Beccles: a patch at least 150 yards long in a ditch near Badingham, F. M. Day.

558/3. Mentha longifolia (L.) Huds. 42, Brecon; Afon Llynfi, N. of Three Cocks Junction, E. C. Wallace and P. M. Hall. *†45, Pembroke; refuse-heaps, Haverfordwest, 1930, A. E. Ellis.

558/3g. Mentha longifolia (L.) Huds. var. pulverulenta Strail. 46, Cardigan; roadside, Towyn Warren, 1927, A. E. Ellis. [Add to *C.F.* but see previous record for species in *Welsh Fl. Pl.*, 123 (1934).—Ed.]

558/3×1. ×Mentha niliaca (Jacq.) Fraser nearest to var. villosa (Huds.) Fraser. 100, Clyde Isles; one clump in corner of grass field, Bute, 1928. A. E. Ellis.

558/3×1. ×Mentha niliaca (Jacq.) Fraser var. Webberi Fraser. 99, Dumbarton; sea shore at Arrochar, E. C. Wallace.

558/6d. Mentha piperita L. var. subcordata Fraser. 1, W. Cornwall; waste ground, Brane, near Sennen, 1926. A. E. Ellis. 37, Worcester; Sherrard's Green, Guarlford, F. M. Day. 48, Merioneth; N. shore of Bala Lake, 1921, A. E. Ellis.

558/7c. Mentha aquatica L. var. Lobeliana Briq. 27, E. Norfolk; Gillingham Marshes: 36, Hereford; Everbatch ["very nearly this var."—A.L.S.], F. M. Day.

558/7e. Mentha aquatica L. var. major Sole. 37, Worcester; Link Mill, Malvern Link, F. M. Day. 59, S. Lancs.; pond at Penwortham, near Preston, H. E. Bunker. 68, Cheviotland; (approaching var. *denticulata* Strail) Holy I., 1906, H. K. Wallace, comm. A. E. Ellis.

558/7j. Mentha aquatica L. var. denticulata Braun. 37, Worcester; Drugger's End, Castlemorton, F. M. Day.

558/9b. Mentha verticillata L. var. paludosa Sole. 36, Hereford; Evendine, Colwall, F. M. Day.

558/9c. Mentha verticillata L. var. ovalifolia H. Braun. 36, Hereford; Bloody Furlong, Colwall, F. M. Day.

*558/9q. Mentha verticillata L. var. rivalis Sole. 25, E. Suffolk; Wolsey Bridge, Southwood: Wenhaston, 1931: 36, Hereford; Cradley, F. M. Day.

558/10. Mentha gentilis L. 3, S. Devon; garden at The Goat House, Brixham, F. M. Day. [I have no recollection of this being planted here. Like all other specimens of this Mint from the Torquay district it has hairy pedicels and calyces.—F.M.D.] 6, N. Somerset; Westhay Heath, Mrs C. Sandwith and A. L. Still. *59, S. Lancs.; near Liverpool, 1809, J. Shepherd ex Stansfield (1938: 14).

558/12. ×Mentha rubra Huds. 1, W. Cornwall; waste ground, Brane, near Sennen, 1926, A. E. and E. M. Ellis.

558/13b. Mentha arvensis L. var. obtusifolia Briq. 36, Hereford; Hoe Court Farm, Colwall, F. M. Day.

558/13d. Mentha arvensis L. var. agrestis (Sole) Smith. 45, Pembroke; refuse-heaps, Haverfordwest, 1930, A. E. Ellis.

558/13e. Mentha arvensis L. var. austriaca (Jacq.) Briq. 36, Hereford; Brock Hill, Colwall: Stonehouse Farm, Mathon, F. M. Day.

558/13f. Mentha arvensis L. var. praecox (Sole) Fraser. 36, Hereford; Ridgeway, Cradley: Downs School garden, Colwall: 37, Worcester; Pinn's Green, Newland, F. M. Day.

558/13g. Mentha arvensis L. var. Allionii (Bor.) Briq. 37, Worcester; Pinn's Green, Newland, 1937, F. M. Day.

558/13l. Mentha arvensis L. var. cuneifolia Lej. & Court. 3, S. Devon; Dittisham, F. M. Day.

†562/3. Calamintha grandiflora (L.) Moench. 88, Mid Perth; beside Highland burn, near Lochearnhead, Miss M. Stewart, comm. Miss U. K. Duncan.

562/7. Calamintha Nepeta Savi. 15, E. Kent; Key Street, J. E. Lousley.

564/4. Bartsia viscosa L. 17, Surrey; Carshalton, 1927, S. A. Chambers ex Salisbury (1938: 70): recorded in Salmon, *Fl. of Surrey*, 498 (1931), but omitted in *C.F.* *20, Herts.; near Welwyn (Salisbury: 1938); the species is of recent origin in this locality where it grows in wet ground adjoining artificial lakes constructed between 1926 and 1930: it is suggested that introduction was effected by migrant water-fowl. Salisbury (*loc. cit.*) illustrates the general British distribution of this species by a map and compares the occurrence of this species in Norfolk (see Tutin; 1936 B) with the former occurrence of *Wahlenbergia hederacea* (see p. 47 above): a humid climate appears to be necessary for the full development of this species together with high autumnal temperature for the proper ripening of seeds.

*†565/1. Melissa officinalis L. 8, S. Wilts.; Limpley Stoke, J. D. Grose.

566/1. Salvia pratensis L. 53, S. Lincs.; in a grass field on cornbrash near Sleaford, Miss J. Gibbons.

†566/17. Salvia verticillata L. 20, Herts.; Great Amwell, P. H. Cooke. †25, E. Suffolk; Felixstowe Docks, Miss W. Wilkinson. †37, Worcs.; railway bank, Hannington, W. H. Hardaker.

†566/21. **Salvia lanceolata** Willd., *Enum.*, 37 (1809). Alien, Southern N. Amer. (Nebraska to Mexico). 32, Northants.; waste ground, Sibbertoft, 1920, A. E. Ellis.

†581/2. Lamium maculatum L. 23, Oxon.; established in lane near Wilcote Church, Lady Roche.

†588/1. Plantago indica L. 54, N. Lincs.; Boston, F. T. Baker.

†588/11. Plantago Psyllium L. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

593/2. Herniaria glabra L. 53, S. Lincs.; in quantity in a gravel-pit, Ranceby (near Ancaster, whence it is already recorded), Miss J. Gibbons.

†596/6. Amaranthus retroflexus L. 1, W. Cornwall; Trenance Farm, Mullion, E. J. Perry, comm. A. L. Still. †16, W. Kent; Tonbridge, J. P. M. Brenan.

†596/6b. Amaranthus retroflexus L. var. Delilei Thell. 38, Warwick; pasture, Wilmcote, near Stratford, W. H. Hardaker.

†596/15. **Amaranthus vulgatissimus** Speg., *Anal. Mus. Buenos Aires*, 7, 135 (1902). Alien, Argentine. 41, Glamorgan; Cardiff, 1937, R. L. Smith and A. E. Wade, see p. 81 below. [Previously recorded with "cf." from Bristol in *B.E.C. 1932 Rep.*, 353 (1933).—Ed.]

600/2. Chenopodium botryodes Smith. 16, W. Kent; near Red House Farm, Isle of Grain, J. E. Lousley and R. C. L. Burges.

†600/5b. Chenopodium urbicum L. var. intermedium (Mert. & Koch) Moq. 37, Worcs.; Longdon, W. H. Hardaker.

†600/6. Chenopodium murale L. 17, Surrey; Epsom Downs, J. E. Lousley and R. C. L. Burges. †37, Worcs.; Broadwater tip, Kidderminster, W. H. Hardaker.

†600/7. Chenopodium opulifolium Schrad. 16, W. Kent; Tonbridge, J. P. M. Brenan.

†600/8h. Chenopodium album L. var. subficifolium (Murr) Druce. 41, Glamorgan; waste ground, Maendy, Cardiff, Miss E. Vachell.

†600/8k. Chenopodium viride L. 39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple.

†600/8×8(2). **Chenopodium album** L. × **reticulatum** Aellen. 23, Oxon.; Manor Road, Oxford, J. P. M. Brenan and J. Chapple. Dr P. Aellen remarks on specimens sent:—"Fruits not yet ripe: *Ch. album* × *retic.* not impossible, but not sure." However ripe fruits have been procured and on examination the structure is quite intermediate and there seems to be no doubt.—J.P.M.B.

†600/8(2). Chenopodium reticulatum Aellen. 15, E. Kent; roadside near Challock Lees, 1937: †16, W. Kent; Tonbridge, 1936-8, J. P. M. Brenan, det. Dr P. Aellen. †39, Staffs.; Burton-on-Trent, R. C. L. Burges and J. F. G. Chapple, det. J. P. M. Brenan.

†600/12. Chenopodium ficifolium Smith. 17, Surrey; Epsom sewage farm, A. E. Ellis.

†600/19. Chenopodium Botrys L. 34, W. Gloster; Wapping Wharf, Bristol Harbour, Mrs C. I. Sandwith and N. Y. Sandwith.

†600/24. Chenopodium Berlandieri Moq. ssp. Zschackei (Murr) Zobel. 6, N. Somerset; Portishead, J. P. M. Brenan. †18, S. Essex; Dagenham, J. P. M. Brenan and N. E. G. Cruttwell. Both det. Dr P. Aellen.

†600/34(7). **Chenopodium missouriense** Aellen, *Bot. Not.*, 206 (1928). Native of N. America. 16, W. Kent; Tonbridge, J. P. M. Brenan and N. D. Simpson, det. Dr P. Aellen.

†602/1. ROUBIEVA MULTIFIDA (L.) Moq. 25, E. Suffolk; Felixstowe Docks, J. E. LOUSLEY.

†606/5b. ATRIPLEX HASTATA L. var. MICROTHECA Rafn. 23, Oxon.; waste ground, Oxford, J. F. G. CHAPPLE, det. A. J. WILMOTT.

†607/1. AXYRIS AMARANTOIDES L. 11, S. Hants.; Knap Mill, Christchurch, 1921, N. D. SIMPSON.

†613/3. SALSOLA PESTIFERA Nelson. 25, E. Suffolk; Felixstowe Docks, J. E. LOUSLEY.

615/5c. POLYGONUM AMPHIBIUM L. var. GLANDULOSUM Schönh. 99, Dumbarton; Arrochar, arable land in Glen Loin, E. C. WALLACE.

†615/32. POLYGONUM CUSPIDATUM Sieb. & Zucc. 17, Surrey; Epsom, waste ground on sewage farm, A. E. ELLIS.

†618/20(2). **Rumex graecus** Boiss. & Heldr. in Boiss., *Diagn.*, *Ser. 2*, fasc. 4, 80 (1859). Alien, E. Medit. Region. See p. 148 below.

†618/28. **Rumex confertus** Willd. replaces *R. giganteus* Ait. in *Br. Pl. List*: see p. 149 below.

†618/31. **Rumex stenophyllus** Ledeb., *Fl. Altaica*, *2*, 58 (1830). Alien, E. Eur. to N. Asia. See p. 149 below.

†619/1. EMEX SPINOSA Campd. 39, Staffs.; Burton-on-Trent, R. C. L. BURGES and J. F. G. Chapple.

623/1. DAPHNE MEZEREUM L. 9, Dorset; Overmoigne, Miss V. M. LEATHER. [Remove brackets from 9 in *C.F.*: several native localiites for this species are given by Mansel-Pleydell, *Flora of Dorsetshire*, 240 (1895).—ED.]

†625/1. HIPPOPHAE RHAMNOIDES L. 45, Pembroke; Tenby, 1937, J. D. GROSE. [Add to *C.F.*; for previous records see *Welsh Fl. Pl.*, 134, 1934.—ED.]

*628/5. EUPHORBIA PLATYPHYLLOS L. 53, S. Lincs.; cornfield near Monk's Wood, Carlby, Mrs C. L. WILDE.

†628/9. EUPHORBIA VIRGATA Waldst. & Kit. 22, Berks.; Thames-side near Wallingford, Lady SEVERN.

†628/9b. EUPHORBIA VIRGATA Waldst. & Kit. f. ESULIFOLIA Thell. 11, S. Hants.; railway-bank, Fullerton Junction, Mrs FOGGITT, det. A. J. WILMOTT.

628/16. EUPHORBIA LATHYRIS L. Add to *C.F.* 7, N. Wilts.; see Preston, *Fl. Wilts.*, 266, 1888.—J. D. GROSE. *†61, S.E. Yorks.; Elvington, 1936, W. A. Sledge ex Wilson (1938: 25).

†628/26. **Euphorbia cuneifolia** Guss., *Pl. rar.*, 190 (1826). Alien, S. Europe. 61, S.E. Yorks.; King George Dock, Hull, 1932, F. Singleton ex Wilson (1938: 25).

†631/1. BUXUS SEMPERVIRENS L. 13, W. Sussex; South Stoke, steep beechwood by the Arun, E. C. WALLACE.

†632/2. MERCURIALIS ANNUA L. 3, S. Devon; Furzeham, Brixham: †25, E. Suffolk; plentiful as a weed, Southwold and Beccles, F. M. DAY.

633. ULMUS L. Determined by R. MELVILLE.

633/6. ULMUS STRICTA Lindl. 4, N. Devon; banks of R. Okement, Nethercott, Iddesleigh, A. E. ELLIS.

633/6b. ULMUS STRICTA Lindl. var. SARNIENSIS (Loud.) Moss. 32, Northants; Clipston, 1921, A. E. ELLIS.

†633/7. **Ulmus laevis** Pall., *Fl. Ross.*, *1*, 75 (1784). Alien, Central Europe. 17, Surrey; Ham, A. E. ELLIS.

643/1b. ALNUS GLUTINOSA (L.) Gaertn. var. LACINIATA Ehrh. 17, Surrey; Beddington Park, near Croydon, one large tree, A. E. ELLIS.

*†647/1. CASTANEA SATIVA Mill. 7, N. Wilts.; self-sown in Savernake Forest, J. D. GROSE.

*†650/1. SALIX PENTANDRA L. 8, S. Wilts.; Hill Deverill, J. D. GROSE. [*C.F.* should read:—1, 32-34, etc. (2, 3, 7, etc.).—J.D.G.] †17, Surrey; 2 trees by Cut Mill pond, E. M. HAZELTON, comm. A. E. ELLIS. 100, Clyde Isles; edge of wood. Rhutlan, Bute, 1928, A. E. ELLIS.

650/4b. SALIX TRIANDRA L. var. HOFFMANNIANA (Smith) Bab. 22, Berks.; Frilford, Lady DAVY, J. P. M. BRENAN and J. F. G. CHAPPLE.

650/4×6. SALIX TRIANDRA L. × VIMINALIS L., ♀. 28, W. Norfolk; by R. Wensum, Great Ryburgh, A. E. ELLIS, det. A. J. WILMOTT.

650/6c. SALIX VIMINALIS L. var. LINEARIFOLIA Wimm. & Grab. 13, W. Sussex; bank of R. Arun between N. Stoke and S. Stoke, E. M. HAZELTON, comm. A. E. ELLIS.

650/8. SALIX CAPREA L. 16, W. Kent; one bush at Abbey Wood, near Plumpstead-on-Thames, with nearly all catkins hermaphrodite, P. H. COOKE.

650/17. Salix myrsinites L. 97, W. Inverness; Aonach Beag, eastern corrie, alt. *c.* 3000 ft., E. C. Wallace.

*651/1. Populus canescens Smith. 7, N. Wilts.; Great Bedwyn: Kington Langley: Okus, Swindon: *8, S. Wilts.; Etchilhampton: Alderbury; J. D. Grose, det. A. B. Jackson.

†651/3b. Populus nigra L. var. betulifolia (Pursh) Torrey. 7, N. Wilts.; between Swindon and Coate, J. D. Grose, det. A. B. Jackson.

*652/2. Empetrum hermaphroditum Hagerup. 94, Banff; lower slopes of Ben Avon, above Loch Builg, *c.* 2200 ft., A. H. G. Alston and N. Y. Sandwith.

*653/2. Ceratophyllum demersum L. 77, Renfrew; canal timber basin, Firhill, Glasgow, W. Rennie, comm. J. R. Lee.

91. Orchidaceae Lindl. Determined by P. M. Hall (except where indicated).

666/1. Epipogium aphyllum Swartz. 36, Hereford; moist oak wood, Wye Valley, late July 1910, C. C. Mountfort, comm. F. M. Day. [This is no doubt the specimen referred to by Godfery, *Mon. and Icon. Nat. Brit. Orch.*, 119 (1933). "a solitary example is said to have been found near Ross on Wye, Herefordshire, in 1910." The specimen was traced by Mr Day and at his request Mr Mountfort kindly allowed me to examine the specimen, which is in good condition, having two flowers and a piece of the coral-like rhizome attached.—P. M. Hall.]

668/2. Epipactis latifolia (L.) All. H. 39, Antrim; Redhall Glen, near Ballycarry, N. D. Simpson and J. P. M. Brenan.

668/4. Epipactis purpurata Smith. 38, Warwick; Bevington Waste, N.W. of Evesham, on Liassic clay, W. H. Hardaker.

669/7. Orchis latifolia L. 9, Dorset; Powerstock, between Barrowland Farm and railway, A. W. Graveson, comm. R. Good. 26, W. Suffolk; Thelnetham Fen: 27, E. Norfolk; Roydon Fen, near Diss: 28, W. Norfolk; Blo' Norton Fen, P. M. Hall, H. W. Pugsley, N. Y. Sandwith and E. C. Wallace. 61, S.E. Yorks.; Newbald Springs, A. K. Wilson.

669/7c. Orchis latifolia L. var. pulchella (Druce) Pugsl. 12, N. Hants.: western edge of Laffan's Plain, between Fleet and Aldershot, G. Watts. 27, E. Norfolk; Roydon Fen, near Diss, P. M. Hall, H. W. Pugsley, N. Y. Sandwith and E. C. Wallace.

669/7×10. Orchis latifolia L. × maculata L. (*sec.* Druce). 11, S. Hants.; marshy meadow near Soberton, P. M. Hall and E. Milne-Redhead.

669/7×8. ORCHIS LATIFOLIA L. × PRAETERMISSA Druce. 8, S. Wilts.; marsh, Sharcott, near Pewsey, R. B. CROSSKEY, comm. P. M. HALL. 26, W. Suffolk; Thelnetham Fen: 28, W. Norfolk; Blo' Norton Fen, P. M. HALL, H. W. PUGSLEY, N. Y. SANDWITH and E. C. WALLACE.

669/8. ORCHIS PRAETERMISSA Druce. 26, W. Suffolk; Thelnetham Fen: 28, W. Norfolk; Blo' Norton Fen, P. M. HALL, H. W. PUGSLEY, N. Y. SANDWITH and E. C. WALLACE. [The Blo' Norton plants were mostly very typical but those at Thelnetham were not, though clearly belonging to this species. One rather doubtful specimen, probably of this species, was also seen in Roydon Fen, near Diss, E. Norfolk (27).—P. M. HALL.]

669/9. ORCHIS PURPURELLA T. & T. A. Stephenson. 62, N.E. Yorks.; Pickering, H. HIGHFIELD, det. and comm. T. STEPHENSON. 66, Durham; Stanhope, 1905, H. K. WALLACE, comm. A. E. ELLIS. 68, Cheviotland; S.E. of Otterburn, P. M. HALL and W. A. SLEDGE. *93, N. Aberdeen; bogs on moorland between Huntly and Edinglassie, A. H. G. ALSTON, Mrs C. I. SANDWITH and N. Y. SANDWITH [det. V. S. SUMMERHAYES at Kew].

669/9×674/1. ORCHIS PURPURELLA T. & T. A. Stephenson × GYMNADENIA CONOPSEA (L.) R. Br. 104, Inner Ebudes; Broadford, Skye. J. E. LOUSLEY, R. C. L. BURGES and J. W. CARDEW.

669/10. ORCHIS MACULATA L. (*sec.* Druce). 30, Beds.; Flitwick, J. G. DONY.

669/10×8. ORCHIS MACULATA L. (*sec.* Druce) × PRAETERMISSA Druce. 30, Beds.; Flitwick, J. G. DONY.

669/10×9. ORCHIS MACULATA L. (*sec.* Druce) × PURPURELLA T. & T. A. Stephenson. 88, Mid Perth; wet pasture W. of Lawers Hotel, P. M. HALL and W. A. SLEDGE.

669/10×674/1. ORCHIS MACULATA L. (*sec.* Druce) × GYMNADENIA CONOPSEA (L.) R. Br. 62, N.E. Yorks.; Low Horcum: 88, Mid Perth; Litigan, near Keltney Burn: on right bank of R. Lyon between Invervar and Inverinain, P. M. HALL and W. A. SLEDGE.

669/11. ORCHIS FUCHSII Druce. 61, S.E. Yorks.; Newbald Springs: Bromfleet Delphs: Sancton marsh, A. K. WILSON.

669/11×7. ORCHIS FUCHSII Druce × LATIFOLIA L. 27, E. Norfolk; Roydon Fen, near Diss, P. M. HALL, H. W. PUGSLEY, N. Y. SANDWITH and E. C. WALLACE. 61, S.E. Yorks.; Newbald Springs, A. K. WILSON.

669/11×9. ORCHIS FUCHSII Druce×PURPURELLA T. & T. A. Stephenson. 66, Durham; Fulwell quarry, near Sunderland, P. M. HALL and W. A. SLEDGE.

671/1. ACERAS ANTHROPOPHORUM (L.) R. Br. 23, Oxon.; Ipsden, found by a village boy who told his employer, Mrs H. A. Reade, about it: there is a specimen in Hb. Reading Univ. and a photo of a plant *in situ* in Hb. Druce: in *Fl. Oxon.*, ed. 2, among several unconfirmed records for this species, it is stated that "a friend of the Rev. C. E. Abbey says he has seen it near Checkendon." It is not improbable that this might refer to the Ipsden locality.—J. F. G. CHAPPLE. [In *B.E.C. 1933 Rep.*, 680 (1934), Pearsall and I referred to the existence of specimens from Mapledurham, 1853 (*Syme*) in Hb. Mus. Brit. and supposed this species to be extinct in Oxfordshire. It is very satisfactory to know that this is not the case.—P. M. HALL.]

674/3×1. GYMNADENIA ALBIDA (L.) Rich. × CONOPSEA (L.) R. Br. = ×SCHWEINFURTHII Heg. 62, N.E. Yorks., E. J. BEDFORD.

674/4. COELOGLOSSUM VIRIDE (L.) Hartm. H. 34, E. Donegal; pasture, Lough Laheen: H. 40, Derry; fixed dunes near the Umbra; N. D. SIMPSON and J. P. M. BRENAN.

674/6. PLATANTHERA CHLORANTHA (Cust.) Reichb. 30, Beds.; Chicksands, 1937, J. G. DONY.

674/7. PLATANTHERA BIFOLIA (L.) Reichb. 30, Beds.; Streatley, 1925, J. G. DONY.

†678/2. CROCUS VERNUS (L.) All. 9, Dorset; Studland, in profusion, Miss V. M. LEATHER. [Add to *C.F.*: see *B.E.C. 1917 Rep.*, 129 (1918), for previous record.—ED.]

†684/3. NARCISSUS BIFLORUS Curt. 9, Dorset; Studland, Miss V. M. LEATHER. [Add to *C.F.*: see Mansel-Pleydell, *Fl. of Dorsetshire*, 263 (1895), for earlier records.—ED.]

†685/1. GALANTHUS NIVALIS L. 16, W. Kent; naturalized in Lamberhurst churchyard, L. R. WALLIS.

*†686/1. LEUCOJUM AESTIVUM L. 74, Wigtown; Ardwell Mill, Stonykirk, W. A. P. SPROTT.

702/3. ALLIUM SCORODOPRASUM L. 68, Cheviotland; wood near Cornhill on Tweed, K. B. Blackburn (*Vasc.*, *24*, No. 3, 107). [I cannot trace any previously recorded locality for this species in 68. *Top. Bot.* gives "68. Maclagan sp." and no doubt this is the source of the record in *C.F.*—G. W. TEMPERLEY.]

†702/8. ALLIUM CARINATUM L. 37, Worcs.; in thousands on N. bank of R. Severn, Upton-on-Severn [add to *C.F.*: recorded from here as from 34 in *B.E.C. 1923 Rep.*, 216 (1924), subsequently corrected to 37 in *B.E.C. 1924 Rep.*, 599 (1925).—J. F. G. CHAPPLE.]; also from near River Severn, Eymore Wood, between Bewdley and Arley, W. H. HARDAKER.

†702/13. Allium Cepa L. 17, Surrey; Epsom, casual on sewage farm, A. E. Ellis.

†702/19. Allium paradoxum G. Don. 68, Cheviotland; several places near Cornhill-on-Tweed, Miss Ware and Miss Corbett, comm. Miss E. Vachell, det. A. J. Wilmott.

707/1. Ornithogalum pyrenaicum L. 17, Surrey; a single plant in garden, Farncombe, Godalming, Mrs C. L. Wilde. [The plant appeared on the edge of a sage patch, where the ground had not been disturbed for years, and its origin is a complete mystery to my brother and myself (except on the thesis set out at end of this note). Its identification is confirmed by my brother, Mr E. B. Bishop. The only Surrey references concerning this species known to us are:—(1) Brewer, *Fl. Surrey*, 311 (1863)—" Only a solitary specimen near Send, about four miles from Guildford; *Lond. Flor.*" (2) Syme, *E.B.*, *9*, 197 (1869)—" Surrey . . . has been reported as producing it, but only on doubtful authority." (3) In *Comital Flora*, p. 297, 17 is given as doubtful. Send is about six miles from Farncombe, and it is very curious that our only acquaintance with *O. nutans* in Surrey was through the finding by me of two or three plants at Send in 1928. Subject to the approval of the Editor, I submit that this note might receive the N.C.R. mark, as this plant was certainly not introduced by us into the garden. We have now occupied our house for over 25 years, and can only suggest that this species has managed somehow to persist unnoticed in the neighbourhood, or else its seeds have lain dormant in the soil (previously meadow or woodland) upon which this house was built 80 years ago.—C.L.W.] [Seed might have been introduced with garden soil or plants. Hardly a N.C.R., as the species has already been recorded for 17 and its status is still uncertain.—Ed.]

†707/2. Ornithogalum umbellatum L. 36, Hereford; one plant, Tarrington Common, probably garden outcast, F. M. Day.

*†708/2. Lilium pyrenaicum Gouan. 61, S.E. Yorks.; dunes on E. side of Spurn Point, R. D'O. Good ex Wilson (1938: 26).

†709/1. Fritillaria Meleagris L. 61, S.E. Yorks.; Wilson (1938: 26): add to *C.F.* and see Robinson, *Fl. E. Riding Yorks.*, 187, 1902, for previous record.

*†710/1. Tulipa sylvestris L. 61, S.E. Yorks.; introduced, Wilson (1938: 26).

718/13. Juncus squarrosus L. 22, Berks.; Boar's Hill, N. E. G. Cruttwell. [Not given for the Ock Division (2) in *Fl. Berks.*, where it is said to be " rare or absent from the north of the county."—J. F. G. Chapple.]

†718/16. Juncus macer S. F. Gray. 13, W. Sussex; Hassocks, about 100 yards west of the v.-c. boundary, 1930, L. A. W. Burder. [See my note in *B.E.C. 1937 Rep.*, 510 (1938), in which however I overlooked a previous record in *B.E.C. 1936 Rep.*, 282 (1937).—Ed.] †59, S. Lancs.; Southport sandhills, Mrs J. V. Phelps.

719/3×2. ×Luzula Borreri Bromf. 13, W. Sussex; bank of lane, Bedham Hill, near Fittleworth, P. M. Hall and E. C. Wallace.

719/7. Luzula arcuata Wahl. 97, W. Inverness; Coire Leis, Ben Nevis, a few plants at the head of the corrie, R. Mackechnie and E. C. Wallace.

722/1. Sparganium neglectum Beeby. 25, E. Suffolk; Dunwich: Wenhaston: Thorington, F. M. Day. 27, E. Norfolk; bank of R. Bure, Aylsham, A. E. Ellis.

722/2. Sparganium ramosum Huds. 27, E. Norfolk; Gillingham Marshes, F. M. Day.

722/2b. Sparganium ramosum Huds. var. microcarpum (Neum.). 25, E. Suffolk; Frostenden: Beccles marshes: 27, E. Norfolk: Gillingham marshes, F. M. Day.

722/3b. Sparganium simplex Huds. var. longissimum Fries. 41, Glamorgan; canal at Nantgarw, Miss E. Vachell.

724/1. Acorus Calamus L. 17, Surrey: Burgh Heath, small pond on the common, E. C. Wallace.

737. Potamogeton L. Determined by J. E. Dandy and G. Taylor.

737/5. Potamogeton alpinus Balb. 3, S. Devon; Exminster Marshes, 1921, W. S. M. D'Urban: R. Culm, Culmjohn, 1901, F. Savery; comm. G. T. Fraser. [Remove brackets from 3 in *C.F.*—Ed.] 64, Mid West Yorks.; Cookridge, 1933, J. B. Wyon: 89, E. Perth; Glen Brerechan, 1896, C. D. Blakiston: both comm. A. E. Ellis. 100, Clyde Isles; Greenan Loch, Bute, 1928, A. E. Ellis.

737/9. Potamogeton gramineus L. 100, Clyde Isles; Greenan Loch and L. Ascog, Bute, 1928, A. E. Ellis.

Not det. Dandy & Taylor.

*737/11. ×Potamogeton nitens Weber. 59, S. Lancs.; Crosby, 1827, J. Shepherd ex Stansfield (1938: 15). 67, S. Northumberland; R. Tyne, Riding Mill, Broomhaugh, S. A. Taylor. 100, Clyde Isles; Greenan Loch, 1928, A. E. Ellis.

737/22. Potamogeton Friesii Rupr. 55, Leics.; canal near Market Harborough, J. F. G. Chapple and N. D. Simpson.

737/23. POTAMOGETON BERCHTOLDII Fieb. 109, Caithness; Halkirk: farm pond near Loch of Wester, Miss E. S. TODD.

737/24. POTAMOGETON RUTILUS Wolfg. All British records are erroneous with the exception of 112, Shetlands (Bardister and Tingwall Lochs). The other records refer to four different species:—*P. pusillus* (14, 38, 39, 52, 77, 111); *P. Berchtoldii* (64); *P. trichoides* (86); *P. pectinatus* (109).—Dandy and Taylor (1938 C).

*737/25. POTAMOGETON PUSILLUS L. (*P. panormitanus* Biv.-Bern.). 7, N. Wilts. and *8, N. Wilts.; canal, Great Bedwyn, 1937, J. D. GROSE and E. C. WALLACE. *23, Oxon.; canal at Wolvercote: gravel-pit near Cassington, J. F. G. CHAPPLE. *38, Warwick; Coventry Canal, Atherstone: *39, Staffs.; Marl Pits, Fradley: both without date, J. A. Power, Hb. Salmon in Hb. Mus. Brit.: *77, Lanark; Glenbuck Reservoir, 1934, G. TAYLOR (recorded as *P. rutilus* Wolfg. *teste* Pearsall in *B.E.C. 1934 Rep.*, 845, 1935); Dandy and Taylor (1938 C). 109, Caithness; Loch of Wester, Miss E. S. TODD.

737/27. POTAMOGETON TRICHOIDES Cham. & Schlecht. All the British records have been revised and all the available material reviewed by Dandy and Taylor (1938 B). This species has been much confused by previous British authorities with other species such as *P. Berchtoldii*, *P. pusillus*, *P. rutilus*, etc. Full particulars of these errors are set out in the paper. The distribution as known at present is:—*5, 6, *13, 14, 17, *21, 25, 26, 27, 28, 29, *30, 31, 33, *52, *54, *86. Requiring confirmation—12, 39. Errors—3 and 4 (*P. Berchtoldii*) [4 was recorded by Hiern in *Vict. Hist. Dev.*, 68 (1906) but was not included in *C.F.*—ED.], 88 (*P. pusillus*). H. 38 (the material, which is in Hb. Mus. Brit., is correct but the record is excluded on account of the doubt attaching to the accuracy of Orr's labels).

737/28. POTAMOGETON PECTINATUS L. 109, Caithness; Loch of Wester, Miss E. S. TODD.

745/2. HELEOCHARIS UNIGLUMIS Schultes. 22, Berks.; saline meadow, Marcham, J. P. M. BRENAN and J. F. G. CHAPPLE.

746/2c. SCIRPUS MARITIMUS L. var. CONGLOBATUS S. F. Gray. 16, W. Kent; Swanscombe marsh, P. H. COOKE.

746/15. SCIRPUS RUFUS (Huds.) Schrad. 97, W. Inverness; foreshore, Morar, E. C. WALLACE.

747/1. ERIOPHORUM LATIFOLIUM Hoppe. 17, Surrey; swamp draining into the Eden Brook, 1937, A. Beadell ex C. E. Britton (*J.B.*, *76*, 23), who also calls attention to the omission in C. E. Salmon's *Flora of Surrey* of the Reigate Heath locality given in the earlier Flora of J. D. Salmon and Brewer. 22, Berks.; Cumnor, J. F. G. CHAPPLE.

753. CAREX L. Determined or confirmed by E. NELMES.

753/1. CAREX PSEUDO-CYPERUS L. 25, E. Suffolk; Wolsey Bridge, near Southwold: 37, Worcester; Mill Coppice, Cowleigh, F. M. DAY.

753/4. CAREX VESICARIA L. 28, W. Norfolk; Congham, A. E. ELLIS.

753/9c. CAREX HIRTA L. var. HIRTIFORMIS Pers. 17, Surrey; Sheerwater, Woking, A. E. ELLIS.

753/17. CAREX DISTANS L. 14, E. Sussex; Eridge Green, A. E. ELLIS.

753/21. CAREX LEPIDOCARPA Tausch. 11, S. Hants.; marshy meadow near Soberton, P. M. HALL and E. MILNE-REDHEAD. 22, Berks.; Cumnor, J. F. G. CHAPPLE. 78, Peebles; by Newhall Burn, P. M. HALL.

753/22. CAREX OEDERI Retz. 27, E. Norfolk; Bryant's Heath, Felmingham, A. E. ELLIS.

*753/40. CAREX ATROFUSCA Schkuhr. 104, Rhum; observed somewhat sparingly on the Ard Nev-Orval massif, not very far from one of Dr Clark's localities for *Thlaspi calaminare*, J. W. HESLOP HARRISON. [Specimens not seen by Nelmes.]

753/42. CAREX HALLERI Gunn. 88, Mid Perth; Glen Lyon, Coire Heasgarnich, very sparingly, R. MACKECHNIE, P. M. HALL, W. A. SLEDGE and E. C. WALLACE.

753/49c. CAREX GOODENOWII Gay var. JUNCEA (Fries) Aschers. 34, W. Gloster; May Hill, Longhope ("probably this"), F. M. DAY. 37, Worcester; Longdon Marsh, F. M. DAY.

*753/52. CAREX ELONGATA L. 9, Dorset; near Trickett's Cross, Miss V. M. LEATHER. 13, W. Sussex; Billingshurst, still by the Wey and Arun canal, E. C. WALLACE.

753/57×59. ×CAREX AXILLARIS Good. 7, N. Wilts.; Braydon: Battle Lake: Hannington: 8, S. Wilts.; Potterne: Green Lane Wood, J. D. GROSE. [Add both to *C.F.*; for previous records see Preston, *Fl. Wilts.*, 333, 1888.—J.D.G.]

753/60. CAREX CONTIGUA Hoppe. 6, N. Somerset; Blackdown: 13, W. Sussex; Newbridge, Billingshurst: 28, W. Norfolk; Holkham, A. E. ELLIS.

*753/70. CAREX MARITIMA Gunn. (*C. incurva* Lightf.) 67, S. Northumberland; dunes between Seaton Sluice and Blyth, K. B. Blackburn (*Vasc.*, *24*, No. 3, 75): Tynemouth, 1877, but not previously recorded, T. Robson ex J. W. Heslop Harrison, K. B. Blackburn and W. A. Clark (*loc. cit.*). [Specimens not seen by Nelmes.]

†754/1. Panicum miliaceum L. 3, S. Devon; Flowerpot fields, Exeter, A. E. Ellis, det. C. E. Hubbard.

†754/8. Echinochloa Crus-galli (L.) Beauv. 9, Dorset; garden weed, Studland, Miss V. M. Leather. [Add to *C.F.*: see *B.E.C. 1917 Rep.*, 133 (1918), for previous record.—Ed.]

†754/8e. Echinochloa Crus-galli L. var. **mitis** (Pursh) Peterm., *Fl. Lips.*, 82 (1838). *Panicum Crus-galli* L. var. *mite* Pursh, *Fl. Amer. Sept.*, 66 (1814). Alien, N. Am. 41, Glamorgan; Splott, 1937: Cardiff, R. L. Smith and A. E. Wade, see p. 82 below.

*†754/10. Digitaria sanguinalis (L.) Scop. 61, S.E. Yorks.; Wilson (1938: 26).

†765/6. Phalaris brachystachys Link. 23, Oxon.; Jackdaw Lane, Oxford, J. P. M. Brenan.

*†766/2. Anthoxanthum Puelii Lec. & Lam. 7, N. Wilts.; sandy fallow near Spye Park, J. E. Lousley and J. D. Grose. *†61, S.E. Yorks.; King George Dock, Hull, 1935, T. Stainforth ex Wilson (1938: 27).

770/4. Alopecurus bulbosus Gouan. 28, W. Norfolk; Holkham, A. E. Ellis.

770/5×1. Alopecurus geniculatus L. × pratensis L. = × A. hybridus Wimm. 14, E. Sussex; by the Cuckmere close to Alfriston, J. P. M. Brenan.

*778/1. Mibora verna (L.) Desv. 67, S. Northumberland; Seaton Sluice, J. W. Heslop Harrison, K. B. Blackburn and W. A. Clark (*Vasc.*, *24*, No. 3, 75-76). [The authors also state:—"A year or two ago it turned up in Norfolk": a reference to this discovery would be welcomed.—Ed.]

783/1. Calamagrostis epigejos (L.) Roth. 11, S. Hants.; margin of field near S. Hayling railway station, P. M. Hall.

†794/1. Avena fatua L. 36, Hereford; Mathon: 37, Worcester; Birtsmorton, F. M. Day.

*†797/1. Cynodon Dactylon (L.) Pers. 19, N. Essex; Dovercourt, well-established on beach near bathing huts, J. E. Lousley.

†801(2). **Cortaderia** Stapf., *Gard. Chron., 3rd Series, 22*, 396 (1897). Pampas-grass.

†801(2). **Cortaderia Selloana** (Schult.) Aschers. & Graebn., *Syn. Mitteleur. Fl.*, *2*, 325 (1900). Cult., origin S. Amer. 9, Dorset; heath, South Haven Peninsula, 1937 and 1938, N. D. Simpson.

†808/1. Cynosurus echinatus L. 15, E. Kent; sea-shore, Sandwich, H. B. Willoughby-Smith. †17, Surrey; oat-field, near Kingswood Station, Chipstead, A. E. Ellis. *†61, S.E. Yorks.; King George Dock, Hull, 1932, T. Stainforth ex Wilson (1938: 27). *†74, Wigtown; roadside about 1 mile W. of Glenluce, W. A. P. Sprott.

814/1. Catabrosa aquatica (L.) Beauv. 41, Glamorgan; near Neath, Miss M. Thomas.

†815/1. Eragrostis cilianensis (All.) Vig.-Lut. 17, Surrey; waste ground, Clandon crossroads, E. C. Wallace and A. L. Still.

†815/2. Eragrostis poaeoides Beauv. (*E. minor* Host). 17, Surrey; waste ground, Clandon crossroads, E. C. Wallace and A. L. Still.

†815/8. **Eragrostis pectinacea** (Michx.) Nees, *Fl. Afr. Austr.*, 406 (1841). *Poa pectinacea* Michx., *Fl. Bor. Amer.*, *1*, 69 (1803). Alien, N. Am. 41, Glamorgan; Cardiff, R. E. Smith and A. E. Wade, see p. 83 below.

824/2b. Poa pratensis L. var. angustifolia (L.) Wahl. 13, W. Sussex; Lancing College, 1926: 17, Surrey; Sheerwater, Woking, A. E. Ellis, det. C. E. Hubbard. 36, Hereford; railway embankment near Barton Court, Colwall, F. M. Day, det. C. E. Hubbard.

*824/4. Poa pratensis L. var. irrigata (Lindm.) Druce. 69, Westmorland; Hilton Gill at *c.* 1000 ft.: "approaching this," rocks on E. side of High Cup Gill at *c.* 1500 ft.; B.E.C. Excursion, det. C. E. Hubbard.

824/13. Poa bulbosa L. 10, Wight; on the brink of the cliffs between Freshwater and the Needles, J. P. M. Brenan. *23, Oxon.: near Stonesfield, seemingly native, R. Burn and J. P. M. Brenan.

*825/3b. Glyceria declinata Bréb. 16, W. Kent; Tunbridge Wells Common, J. P. M. Brenan. 69, Westmorland; Rundale Beck at *c.* 1500 ft., B.E.C. Excursion, det. C. E. Hubbard. [Add to *C.F.*: see *Fl. Westm.*, 259 (1938), for previous records.—Ed.] 94, Banff; pond behind sand-dunes, Sandend Bay, Cullen, N. Y. Sandwith. [Add to *C.F.*; for previous record see *Journ. Bot.*, 160 (1906).—Ed.]

826/4b × 829/1. Festuca pratensis Huds. × Lolium perenne L. 6, N. Somerset; Frome, A. E. Ellis, det. C. E. Hubbard.

*826/6. Festuca heterophylla Lam. 11, S. Hants.; in a spinney near the road between Lyndhurst and Brockenhurst, S. A. Taylor, det. W. O. Howarth.

826/12. FESTUCA TENUIFOLIA Sibth. (*F. capillata* Lam.). 105, W. Ross; hillside, Dundonnell: 108, W. Sutherland; Cnochan rocks, Miss E. S. TODD, det. W. O. HOWARTH.

826/13. FESTUCA GLAUCA Lam. var. CAESIA (Smith) Howarth. 3, S. Devon; Berry Head, G. M. ASH, J. P. M. BRENAN, J. F. G. CHAPPLE and G. T. FRASER, det. W. O. HOWARTH.

826/17. FESTUCA BROMOIDES L. 37, Worcs.; Broadmoor Wood, W. H. HARDAKER. 38, Warwick; roadside, Grays Mellory, J. P. M. BRENAN and J. F. G. CHAPPLE.

827. BROMUS L. Determined by C. E. HUBBARD.

†827/13(2). **Bromus laciniatus** Beal, *Grasses N. Amer.*, *2*, 615 (1896). (*B. pendulinus* Sessé.) Cult., origin Mexico. 23, Oxon.; Jackdaw Lane, J. P. M. BRENAN. [See note in *B.E.C. 1937 Rep.*, 672 (1938).—ED.]

827/16c. BROMUS SECALINUS L. var. HIRTUS (F. Schultz) Aschers. & Graebn. 17, Surrey; Kingswood, A. E. ELLIS.

827/17. BROMUS COMMUTATUS Schrad. 55, Rutland; Empingham Woods, S. A. TAYLOR.

827/18. BROMUS RACEMOSUS L. 36, Hereford; near Coddington post-office: Mathon: 37, Worcester; Cowleigh, F. M. DAY.

827/19b. BROMUS HORDEACEUS L. var. GLABRATUS Druce. 23, Oxon.; waste ground, Oxford, J. F. G. CHAPPLE.

827/19(2). BROMUS LEPIDUS Holmberg. 23, Oxon.; several localities in Oxford, J. P. M. BRENAN and J. F. G. CHAPPLE. *27, E. Norfolk; sandy field, near Selhouse Broad, S. A. TAYLOR. *32, Northants.; Arthingworth, 1922, A. E. ELLIS.

†827/19(2). BROMUS LEPIDUS Holmberg forma LASIOLEPIS Holmberg. 23, Oxon.; Jackdaw Lane, Oxford, J. P. M. BRENAN. †94, Banff; with the typical plant in a fodder field, Sandend Bay, near Cullen, Mrs C. I. SANDWITH and N. Y. SANDWITH.

†827/22. BROMUS ARVENSIS L. 26, W. Suffolk; near Icklingham, S. A. TAYLOR.

828/2. BRACHYPODIUM PINNATUM (L.) Beauv. 64, Mid West Yorks.; Thorpe Arch, Miss E. S. TODD.

†829/4. LOLIUM MULTIFLORUM Lam. 50, Denbigh; Glyndyfrdwy, 1921, A. E. ELLIS.

†829/4c. LOLIUM MULTIFLORUM Lam. var. COMPOSITUM (Thuill.) Mutel. 37, Worcs.; Hartlebury, W. H. HARDAKER.

830/4c. AGROPYRON REPENS L. var. LEERSIANUM S. F. Gray. 17, Surrey; wheatfield, Langley Bottom, Epsom, A. E. ELLIS.

†831/1. SECALE CEREALE L. 3, S. Devon; Flowerpot fields, Exeter, A. E. ELLIS.

†832/11(2). **Aegilops ligustica** (Savign.) Coss., *B. S. B. Fr.*, *11*, 164 (1864). Alien, Near East. 6, N. Somerset; waste ground, Bristol, I. W. EVANS, comm. N. Y. SANDWITH, det. C. E. HUBBARD.

*833/2. PHOLIURUS INCURVUS (L.) Schinz & Thell. 6, N. Somerset; outer fringe of dunes opposite Berrow Church, growing on dry sand at a point where there is a transition from dune to salt marsh: *P. filiformis* (Roth) Schinz & Thell. was growing nearby on damp spots on the inner side of the salt marsh: *9, Dorset; ledges of limestone rock, Worth Matravers, R. MELVILLE. *15, E. Kent; foot of the chalk cliffs between Folkestone and Dover, 1937, J. P. M. BRENAN.

†835/9. HORDEUM VULGATUM L. var. TRIFURCATUM (Jacq.) Wend. Channel Isles; Lancresse Common, Guernsey, 1936, Miss C. M. ROB.

844/1. EQUISETUM TELMATEIA Ehrh. 13, W. Sussex; Warminghurst, with "sterile stems" bearing cones of sporophylls, A. E. ELLIS.

844/2c. EQUISETUM ARVENSE L. var. NEMOROSUM Braun. 25, E. Suffolk; Blythburgh: Frostenden, etc.: 36, Hereford; Colwall: Coddington, etc., F. M. DAY.

*844/7. EQUISETUM HYEMALE L. 93, N. Aberdeen; open ground among heather in Bin Wood, between Cairnie and Huntly, N. Y. SANDWITH.

*†854/4. POLYSTICHUM LONCHITIS (L.) Roth. 23, Oxon.; on wall of farm-buildings, Sandford St Martin, 1937, J. S. HUGHES.

856/3d. DRYOPTERIS SPINULOSA Kuntze var. DECIPIENS (Syme) Druce. 41, Glamorgan; near Aberdulais, Miss THOMAS and Miss E. VACHELL.

856/8. DRYOPTERIS THELYPTERIS (L.) A. Gray. 12, N. Hants.: Conford, near Liphook, G. M. ASH, comm. E. C. WALLACE.

861/2. WOODSIA ALPINA (Bolton) S. F. Gray. 88, Mid Perth; north side of Glen Lyon, E. C. WALLACE: south side of Glen Lyon, W. A. SLEDGE.

866/1. OPHIOGLOSSUM VULGATUM L. 27, E. Norfolk; Alderfen, near Horning, up to 18 in. tall, A. E. ELLIS.

866/1b. Ophioglossum vulgatum L. var. polyphyllum Braun. 9, Dorset; Studland Heath, near Littlesea, E. C. Wallace, det. A. H. G. Alston.

†868/1. Azolla filiculoides Lam. 37, Worcester; Sherrard's Green, Guarlford, J. Hawkins, comm. F. M. Day.

869/3. Isoetes Hystrix Durieu. 1, W. Cornwall; Kynance valley, 1937, Melville (1938 A), where an account is given of the habitat and associated plants. [Add to *C.F.*: the first record of this species for 1 by F. Robinson in *J.B.*, *57*, 322 (1919), was rejected by Druce as an error in circumstances which are explained by F. Rilstone in *J.B.*, *76*, 56-57.—Ed.]

870/7. Lycopodium Selago L. 99, Dumbarton; Arrochar, wood by Loch Long, almost at sea-level, E. C. Wallace.

[871/4. **Selaginella helvetica** Link, *Fil. Hort. Berol.*, 159 (1841). Fragments of this species were identified in a packet of a moss (*Thuidium tamariscinum*) in the Torquay Natural History Society's herbarium. The moss was part of a collection made by an unknown collector in July 1896 on Slieve Donard, Co. Down (H. 38).—T. Stephenson. This record is bracketed in view of the doubtful circumstances of the case.—Ed.]

118. Characeae Rich. Determined by G. O. Allen.

872/2b. Nitella opaca Agardh, var. attenuata Groves. 4, N. Devon; Dove's Moor, Bulkworthy, 1895, W. P. Hiern ex Allen (1938: 48). 17. Surrey, Haslemere, Allen (*loc. cit.*).

872/3. Nitella flexilis Ag. 41, Glamorgan; Miss Vachell says that the record of this species from Kenfig Pool in *B.E.C. 1937 Rep.*, 597 (1938), is an error and Mr Wade concurs.—Ed. *106, E. Ross; L. Ussie, 1936, Mrs S. Sandeman ex Allen (1938: 49).

*872/6. Nitella mucronata Miq. 17, Surrey; R. Wey, near Little Frensham Pond, 1936, Allen (1938: 49).

873/2. Tolypella prolifera Leonh. 13, W. Sussex; still abundant in a ditch, Amberley Wild Brooks, N. Y. Sandwith.

†876/1. Chara Braunii Gmel. 59, S. Lancs.; still in Reddish Canal, 1937, Miss E. S. Todd ex Allen (1938: 50). [In *B.P.L.*, *ed. 2* (1928), this species is enclosed in ⟨ ⟩ brackets signifying extinction while in *C.F.* (1932) it is described as "now nearly or quite extinct."—Ed.]

876/5. Chara hispida L. 7, N. Wilts.; Bowood, J. D. Grose, det. G. O. Allen. [Add to *C.F.*; for previous records see *Bot. Club Rep.*, *1884-6*, where "v.-c. 8" should read "v.-c. 7."—J.D.G.]

876/7. CHARA CONTRARIA Kütz. 59, S. Lancs.; Springhead, Twiston Moor, A. TURNER. *83, Midlothian; Gladhouse Reservoir, 1935, G. Taylor ex Allen (1938: 50).

*876/7b. CHARA CONTRARIA Kütz. var. HISPIDULA Br. 20, Herts.; Wilstone Reservoir, near Tring, 1937, J. P. M. Brenan ex Allen (*loc. cit.*).

*876/17. CHARA DELICATULA Agardh. 4, N. Devon; near S. Molton, 1893, W. P. Hiern: *15, E. Kent; Minster, Thanet, 1923, G. O. Allen: 16, W. Kent; Keston Ponds, 1919, St J. Marriott; all ex Allen (*loc. cit.*). *64, Mid West Yorks.; moorland pool, Rimmington, at 1000 ft., A. TURNER.

876/17c. CHARA DELICATULA Agardh var. ANNULATA (Wallm.) Groves & B.-Webst. 104, Inner Ebudes; Raasay, 1936, R. B. Cooke ex Allen (*loc. cit.*).

THE WEATHER OF 1938 AND ITS EFFECTS.

(Adapted by permission from The Phenological Report, 1938, of the Royal Meteorological Society.)

After a December with a temperature about 2.5° F. below the normal, January and the first ten days of February were warm, and after a brief colder spell, were followed by a March which broke all records in a warm spell which, accompanied by drought, extended into the first week of April. Then came a cool, dry spell with night frosts both in April and May, followed by a summer and early autumn with temperature not far from the average.

In November the temperature again rose to abnormal heights, and the first really cold spell of the winter did not set in until December.

There was remarkable general uniformity in the incidence and extent of the departures from the normal temperature throughout the districts, and throughout the season. Rainfall was not so equally distributed, and there was great disparity in this respect between the south-eastern and north-western districts. During the warm period in April and early May, the only districts which experienced an average week of excess rainfall were Scotland N. and W., England N.W. and Ireland N. and S., and by the end of the year the excess in these districts had reached values varying from 30 to 80 per cent., while the south-eastern districts had deficits up to 20 per cent. Sunshine after April was deficient for considerable periods until October was reached. Strong gales were experienced in January and February, at the beginning of June and during the first half of October. The wind graphs show how prevalent was S.W. wind in the southern districts and, after March, N.W. wind in the northern districts.

It is now possible to consider the effects of the meteorological conditions throughout the year.

After the cold December the mildness of January and early February was conducive to forwardness and the abnormal warmth of March brought everything forward with a rush. This precocity, which might have been even more generally pronounced under less droughty conditions, was checked by the cold dry weather in April and May and the night frosts which occurred in many places throughout the country in both these months—notably on April 10-11; and between May 7 and 24—caused widespread damage to blossom and foliage. Amongst the listed items noted by many observers as seriously affected are the blossom and foliage of chestnut, beech and oak, and the blossom of hawthorn, lilac, laburnum and white ox-eye, while, outside the list, fruit trees suffered to a greater or less degree according to the date of blossoming and the site characteristics, some of the worst cases, as usual, occurring in valleys.*

*[Orchids suffered severely from the late frosts in many parts of England: in South Hampshire towards the end of May flowering spikes of *Cephalanthera longifolia* were blackened right off by frost.—P.M.H.]

The damage was not confined to plant life; observers have drawn attention to cases of song thrushes and blackbirds having deserted their nests during the drought and of the starvation of young birds.

The effect on the spring migrant birds appears to have been that, after the first arrivals, they were less seen and heard than usual, main bodies being reported as late in some districts, both southern and northern. The first dates of arrival on the graphs indicate that the marked earliness associated with most of the arrivals in February and March in the South was reduced, disappeared, or was changed to lateness in the period April-May in the north.

After this trying period of drought and cold in April and May there was marked recovery in many directions. A reasonably warm and moist late summer and autumn in most districts resulted in the second flowering of many plants, notably lilac, laburnum, hawthorn and blackthorn, while the number of wayside flowering plants reported during the abnormal warm spell in November was remarkable, amounting to more than twenty species, including blackberry, red clover, scarlet pimpernel, white dead nettle, meadow sweet and buttercup.

The appearance of foliage in the autumn, however, reflected the damage done in the earlier months. Following the frosts, strong winds, carrying salt in many localities, even at some distance from the sea, had already caused browning in early June, and the gales of October completed the damage and spoilt or brought down the leaves, except in very sheltered places where the leaves kept green unusually late; autumn colours, as generally understood, were absent in most localities.

But, if plant life generally experienced a trying season it was an exceptionally good year for wheat and mainly satisfactory for barley and oats, and also for the bulk of the potato crop, which showed marked recovery. While grass and hay were sparse in southern districts they were quite good in the northern districts where the drought was less severe, and was followed by copious rains which, however, in some instances caused the promise of good condition to be disappointed by difficulty in harvesting. Incidentally it was a good year for mushrooms.

NOTES ON THE ADVENTIVE FLORA OF THE CARDIFF DISTRICT.

R. L. Smith and A. E. Wade, F.L.S.

In *B.E.C. 1925 Rep.* the writers published an account of the adventive flora of Cardiff, and a supplement to it in *B.E.C. 1926 Rep.* These two papers embodied the results of the preceding five years' field work, together with the majority of other known records of adventive plants for the district, some of them over forty years old.

An account of the adventive flora of a particular district fulfils a different purpose from that of the native flora. The latter usually gives records of all the species and varieties found, and, as these are rarely of isolated plants, it is an indication of what one may reasonably expect to find. Apart from revision of nomenclature and enumeration of segregates, new records, etc., an ordinary Flora is never really out of date. Natural conditions do not change sufficiently to alter the general character of the flora.

An account of an adventive flora, on the other hand, is obsolescent as soon as published, since conditions for adventives are continually changing, methods of introduction ceasing, localities being built over, new industries starting, and new methods being introduced in industry, so that periodic revision of an adventive Flora is a necessity.

During the last ten or twelve years there have been many changes which have influenced the alien flora. There has been practically no new tipping at Cardiff Docks, and the old localities for adventives being at present undisturbed are becoming overgrown with more robust native plants and denizens. This has meant the disappearance of plants from localities in which they have persisted for very many years, e.g., *Inula viscosa*, *Phytolacca decandra*, etc. The locality at Radyr, formerly so prolific in leguminous plants, is now no more, the spot being entirely covered with busy railway sidings. From the character of the established plants at Barry Docks, it seems certain that these were introduced many years ago by ships' ballast, but nowadays, with very rare exceptions, if indeed there are such, ships carry only water ballast, so that that means of introduction has apparently ceased to operate.

At Barry there is a large grain mill, which is responsible for all the recent introductions. Until about three years ago all the waste from this mill was dumped at the edge of a large tidal pool. In some years, notably 1928, the adventive flora along this pool was quite rich. Nowadays practically all waste from the mill is burnt and from now on there will be very few new records for Barry Docks. However the established adventive flora is still of considerable interest and worth a visit, consisting as it does of about 30 adventive species, nearly all of them perennials. Except during the winter months, there is always one or more of these adventive species in flower.

The Cardiff Docks area is fairly large, but no one part of it is rich in adventives. Its established adventive flora consists of about 15 species, again mostly perennials. The numerous railway banks, patches of waste ground, allotment gardens and the like in the district also have their quota of established species. These number about 30, nearly half of them being other than common plants.

The real fascination, however, of seeking adventive species is not in looking for the expected, but for the unexpected. As is usual with most large towns, Cardiff has a number of municipal rubbish-heaps. Each year one or more of these is closed, and new ones started. The Splott locality, for 15 years a prolific hunting ground for adventives, was a large rubbish-dump. It is now closed, and the whole area is included in the lay-out of the new Cardiff Airport. Broadly speaking, any municipal rubbish-dump is likely to produce a fair crop of adventive plants, and their means of introduction is, in most cases, easy of determination. For instance *Guizotia abyssinica* is an ingredient of a proprietary brand of parrot-food; *Artemisia biennis* and *Phalaris canariensis* form part of most sorts of bird-seed; *Setaria italica* is the plant that produces the long curved fruiting spikes sold in every bird-shop; *Carthamus tinctorius* has large whitish seeds, present in most sorts of chicken-food; the various Sorghums form a proportion of some kinds of bird-seed. A few adventive plants owe their origin to the chemists' shop, e.g., *Carum Carvi* and *Coriandrum sativum*.

Occasionally, however, the botanist finds it difficult to account for the presence of a plant. Some years ago we found a prickly *Solanum* that turned out to be *S. ciliatum*, growing amongst ordinary town rubbish, and there were several plants of it all clustered together. Try as we might, we could not discover how the seeds were introduced. The following Christmas we saw on sale in the streets sprigs of *Ruscus* with large orange fruits impaled on the cladodes. These fruits were full of ripe seeds, which when sown produced our prickly *Solanum*. Thus the occurrence had been due to plants thrown away and deposited with the town refuse.

The Cardiff district has owed its richness in adventive species to the presence of a large grain mill. Until a few years ago this mill was operated upon old-fashioned lines, and large quantities of extracted weed seeds were thrown away. Many of these seeds germinated in the vicinity of the mill, but most of them were deposited on the nearest municipal rubbish heap. The town cleansing authorities soon noticed that there was a lot of grass seed in this mill waste, and so they spread it over the levelled tip, thus making a cheap grazing ground for their horses and, incidentally, providing a paradise for the botanist interested in adventive plants. This state of affairs continued for some time, but an unlucky accident put an end to it. One day a valuable horse, sampling the luscious young grass, slipped and cut itself so badly on a broken bottle that it had to be destroyed. This ended the broadcasting of the weed seeds. About the same time, the grain mill was re-built, and modern methods of milling introduced. To-day we have a mill in which practically nothing is wasted. A fair proportion of grain is now imported free from weed seeds, but that which is not is cleaned by special machinery and nearly all the one-time waste made into cattle-food. The ground around this great new mill is practically free from weeds, and all that comes out of the mill itself is human food, cattle-food, and a limited amount of floor sweepings. These sweepings are put in bags and carted to the town rubbish-dump, where the bags are emptied into one heap. The effect of all this is that the area worth exploring for adventives has become much more restricted. Moreover 90 per cent. of the total seeds dumped rot instead of germinating. The lot of the present day seeker after adventive plants is indeed hard. Nevertheless, in spite of all these changes, there are still a fair number of grain-adventives to be found here every summer. Hardly a season passes without at least 30 of these adventives appearing on our rubbish-heaps. 1937 and 1938 have been particularly good. In the former year we observed over 50 adventive species, and in 1938 well over 60, in each case exclusive of the 40 or more established species.

A few of the plants mentioned in this paper are new to the "British Plant List." A number of long established species, e.g., *Impatiens glandulifera*, *Cochlearia Armoracia*, *Senecio squalidus*, etc., have been omitted. The native country or area is given in the case of species new to the Cardiff district. Specimens of the majority of the species recorded have been deposited in the Welsh National Herbarium, National Museum of Wales, Cardiff.

Our thanks are due to Mr F. Norton who, for the last three or four years, has helped us in many ways, and has accompanied us on most of our expeditions, and to Dr R. Melville and Mr C. E. Hubbard for assistance in the identification of doubtful specimens.

RANUNCULACEAE.

4/2. ADONIS AESTIVALIS L. Europe. Splott, 1929.
12/1. NIGELLA DAMASCENA L. Cardiff N., 1938.

PAPAVERACEAE.

21/1. PAPAVER SOMNIFERUM L. Of frequent occurrence on rubbish-heaps.
21/5. P. ARGEMONE L. Barry Docks, 1936.
21/6. P. HYBRIDUM L. Not common in recent years.
23/2. GLAUCIUM CORNICULATUM (L.) Curt. This species occurred quite commonly for a few years as a grain alien.
24/1. ROEMERIA HYBRIDA DC. Now quite gone from this district. It persisted for 10 years.
28/1b. ESCHSCHOLTZIA CALIFORNICA Cham. var. CROCEA (Benth.) Jepson. California. Cardiff N., 1938. A grain alien and not a garden escape.
29/3. HYPECOUM PENDULUM L. Europe. Splott, 1927.

CRUCIFERAE.

35/5. Rorippa austriaca (Crantz) Bess. Europe. This species is quite naturalised on some allotments within the city boundary. Its extensively creeping rhizomes, luxuriant growth, and production of abundant ripe seeds are making it a serious menace to the allotment holders.

42/9. Alyssum incanum L. Appears every summer at Barry Docks.

42/10. A. maritimum Lam. Frequent on rubbish-heaps.

48/3. Malcomia africana Br. Reg. Medit. Splott, 1927.

49/2. Sisymbrium Sophia L. Occurs most years as a grain alien.

49/3. S. altissimum L. Naturalised at Cardiff Docks.

49/4. S. orientale L. Naturalised in three or four places.

50/1. Erysimum cheiranthoides L. Formerly a frequent allotment weed at Splott. Now seldom seen in this district.

52/1. Camelina sativa Crantz. Appears almost every spring on one or other of the city refuse-heaps.

54/6. Brassica Cheiranthos Vill. Still on the railway bank at Grangetown.

54/15. B. alba (L.) Boiss. Of fairly frequent occurrence on rubbish-heaps.

54/22. B. adpressa Boiss. Naturalised in quantity at both Cardiff and Barry Docks.

61/1. Lepidium graminifolium L. Naturalised at both Cardiff and Barry Docks.

61/3. L. Draba L. Abundant on waste ground in several places.

61/4. L. ruderale L. Occasionally found on rubbish-heaps.

61/12. L. sativum L. Frequent on rubbish-heaps.

61/22. L. densiflorum Schrad. Occasionally found on rubbish-heaps.

61/24. L. neglectum Thell. Frequent on rubbish-heaps.

61/25. L. ramosissimum A. Nels. N. Am. Splott, 1927 (*Druce*).

64/1. Thlaspi arvense L. Frequent on rubbish-heaps.

76/2. Rapistrum orientale Crantz. Greece. Barry, 1927.

79/1. Erucaria hispanica (L.) Druce var. lineariloba (Boiss.). Greece. Penarth town rubbish-dump, 1937. Identified as probably *E. lineariloba* Boiss. by Dr Melville.

RESEDACEAE.

85/1. Reseda alba L. Naturalised in abundance at Barry Docks. In flower from early April until late November.

85/5. R. stricta Pers. Europe. Splott, 1930.

CARYOPHYLLACEAE.

93/1. Tunica prolifera (L.) Scop. Cardiff Docks, 1936 (*Mrs Sandwith*).

94/5. Gypsophila elegans M. Bieb. Asia Minor. Splott, 1937. Probably of garden origin.

95/1. Saponaria officinalis L. Naturalised in several places.

95/2. S. Vaccaria L. An occasional grain introduction.

96/7. Silene gallica L. Appears most years with other grain aliens.

96/16. S. dichotoma Ehrh. Persisted for five or six years at Splott, but now gone.

96/27(2). S. coeli-rosa (L.) Godr. Reg. Medit. Splott, 1937.

96/32. S. Antirrhina L. Grain alien. Cardiff E., 1938.

98/5. Lychnis macrocarpa Boiss & Reut. S. Europe. Splott, 1928.

98/9. L. Githago (L.) Scop. Occasionally found as a grain alien.

100/2. Cerastium arvense L. Still at Barry Docks.

106/1. Polycarpon tetraphyllum L. Europe. Barry, 1928.

MALVACEAE.

115/2. Althaea hirsuta L. Splott, 1937.

116/2. Lavatera sylvestris Brot. Splott, 1929; Cardiff N., 1938.

117/7. Malva nicaeensis All. S. Europe. Splott, 1929.

117/9. M. parviflora L. Occasionally found as a grain alien.

117/11. M. hispanica L. S. Europe. Splott, 1927.

122/1. Hibiscus Trionum L. Splott, 1930.

LINACEAE.

125/4. Linum usitatissimum L. A frequent rubbish-heap plant.

GERANIACEAE.

127/7. Geranium pyrenaicum Burm. f. Almost gone from Radyr, but increasing at Barry Docks.

LEGUMINOSAE.

153/1b. Medicago falcata L. var. tenuifoliolata Vuyck. Quite naturalised at both Cardiff and Barry Docks.

153/3. M. sativa L. Naturalised in several places on railway banks, etc.

153/4. M. hispida Gaertn. Splott, 1936.
Var. apiculata (Willd.). Cardiff N., 1938.
Forma confinis (Koch) Burnat. Appears almost every year and is our commonest alien medick.

153/5. M. arabica Huds. Appears occasionally as a grain alien.

153/6. M. minima (L.) Desr. Naturalised in one spot at Cardiff Docks, but gradually disappearing.

153/11b. M. italica (Mill.) Steud. var. marginata (Willd.). Splott, 1937.

154/2. Melilotus alba Desr. Naturalised at Cardiff and Barry Docks.

154/4. M. indica (L.) All. Common about the local docks.

155/37b. Trifolium resupinatum L. var. suaveolens (Willd.). Splott, 159/2. DORYCNIUM RECTUM (L.) Ser. There have been two large plants of this species at Barry for many years. *D. hirsutum* Ser. and *D. herbaceum* Vill. have now gone.

160/7. LOTUS HISPIDUS Desf. Europe. Barry, 1927.

170/1. CORONILLA VARIA L. A dozen or more large patches scattered over the Barry Docks area.

171/1. ORNITHOPUS COMPRESSUS L. Europe. Barry, 1927.

171/4. O. ROSEUS Dufour. W. Europe. Cardiff N., 1938.

171/5. O. PINNATUS (Mill.) Druce. Europe. Barry, 1927.

174(2)/1. ARACHIS HYPOGAEA L. Cardiff W., 1937. In view of the enormous number of seeds which must find their way to refuse-dumps, it is curious that this species is so rarely recorded as an alien.

176/2. VICIA TENUIFOLIA Roth. Europe. Naturalised at Barry. Cardiff E., 1938.

176/6. V. DASYCARPA Tenore. An occasional grain alien.

176/9. V. LUTEA L. Cardiff N., 1938.

176/10. V. HYBRIDA L. Europe. Barry, 1935.

176/24. V. FABA L. Occasionally found on rubbish-heaps.

176/33(3). V. ERIOCARPA Hausskn. Cardiff N., 1938.

178/3. LATHYRUS TUBEROSUS L. Naturalised and increasing at Barry Docks.

178/9. L. APHACA L. Naturalised in small quantity at Barry.

180/1. PISUM ARVENSE L. Occasionally found as a grain alien.

180/5. P. SATIVUM L. Occasionally found on rubbish-heaps.

ROSACEAE.

188/1. FRAGARIA MOSCHATA Duchesne. Still on the railway bank at Radyr.

189/4. POTENTILLA ARGENTEA L. Naturalised and increasing on a railway bank in Barry district.

189/11. P. NORVEGICA L. Less frequent in the district than formerly.

189/17. P. INTERMEDIA L. Naturalised and increasing in two places in Cardiff district.

HALORAGACEAE.

215/1. GUNNERA CHILENSE Lam. Chile. Cardiff N., 1938. A garden outcast.

LYTHRACEAE.

219/3. LYTHRUM MEONANTHUM Link. S. Europe. Cardiff E., 1938.

ONAGRACEAE.

223/1. OENOTHERA BIENNIS L. Naturalised and abundant at Cardiff Docks. Sparingly in other waste places.

223/2. O. GRANDIFLORA Ait. N. Amer. A frequent garden outcast. The buds of this plant are orange not yellow as in *O. biennis*.

223/4. O. muricata L. Still found sparingly on waste ground at Canton, Cardiff.

223/7. O. sinuata L. N. Amer. Persisted for a few years at Cardiff Docks but not seen since 1929.

223/10. O. rosea Ait. N. Amer. Cardiff N., 1938.

223(2)/1. Godetia viminea Spach. Calif. Cardiff N., 1938.

224/1. Fuchsia riccartoni Hort. S. Amer. Cardiff N., 1938.

UMBELLIFERAE.

239/1. Eryngium campestre L. Naturalised at Barry Docks, but does not flower every year.

250/1. Carum Carvi L. Appeared at the same spot at Splott for about six seasons but not seen since 1936.

252/1. Falcaria Rivini Host. Naturalised and increasing at Barry Docks.

263(2)/1. Prangos Uechtritzii Boiss. & Haussk. One large plant at Barry Docks. It flowers every second year, but seldom ripens seed.

279/1. Coriandrum sativum L. Sometimes appears on rubbish-heaps. A vernal species.

283/2. Caucalis daucoides L. Appears almost every June on one waste-heap or another.

283/8. C. latifolia L. Barry Docks, 1928 and 1938. Cardiff Docks, 1936.

RUBIACEAE.

296/10. Galium tricorne Stokes. Occasionally found as a grain alien.

296/15. G. Valantia Weber. Reg. Medit. Splott, 1931.

298/5. Asperula arvensis L. Cardiff Docks, 1936.

VALERIANACEAE.

302/1. Kentranthus ruber (L.) Druce. Naturalised and increasing in one or two places.

COMPOSITAE.

320/3. Erigeron canadense L. Frequent on waste ground.

328/1. Gnaphalium luteo-album L. Europe. Barry, 1928.

333/7. Inula viscosa Ait. Apparently gone from Cardiff Docks, but still at Barry Docks.

339/5. Ambrosia psilostachya DC. N. Amer. Persisted at Barry for 3 years but now exterminated by stronger growing plants.

341/1. Xanthium Strumarium L. Hardly a season goes by without this species turning up somewhere. Only one year (1930) has it fruited with us, although the plants persist until late November.

347/4. Helianthus annuus L. Frequent on rubbish-heaps.

351/1. Guizotia abyssinica Cass. Occasionally found on rubbish-heaps.

353/6. Bidens frondosa L. Decreasing at Cardiff Docks and will probably die out.

354/1. Galinsoga parviflora Cav. An abundant garden-weed on the same allotments where *Rorippa austriaca* grows abundantly.

365/7. Achillea nobilis L. Still at Cardiff Docks, but gone from Barry Docks.

368/1. Anthemis tinctoria L. Now gone from the district.

371/3. Matricaria suaveolens (Pursh) Buch. Very common along roadsides, etc.

378/1. Artemisia Absinthium L. Occasionally found on waste ground.

378/15. A. annua L. Orient. Splott, 1938 (*Miss Todd*).

378/16. A. biennis Willd. Rather frequent on rubbish-heaps.

378/18b. A. gnaphalodes Nutt. Gone from Radyr, but still at Cardiff Docks.

380/3. Petasites fragrans Presl. Naturalised in several places.

383/31. Senecio Cineraria DC. Gone from the district.

386/1. Cryptostemma calendulacea (L.) Druce. S. Africa. Barry, 1927.

389/2. Echinops Ritro L. Europe. Established on a patch of waste ground, Cardiff W.

399/1. Silybum Marianum Gaertn. Occasionally on waste ground.

400/1. Galactites tomentosa Moench. Barry, 1928.

405/12. Centaurea Cyanus L. A frequent grain alien.

405/14. C. paniculata L. Europe. Splott, 1937.

405/15. C. Calcitrapa L. Europe. Splott, 1937.

405/16. C. aspera Willd. Increasing every year at Barry.

405/25. C. diffusa Lam. S. Europe. Splott, 1933 (*Miss E. Vachell*).

405/26. C. orientalis L. S. Europe. Cardiff Docks, 1937 (det. *J. P. M. Brenan* at Kew).

405/31. C. Solstitialis L. Splott, 1938. Cardiff N., 1938.

405/32. C. melitensis L. A frequent grain alien.

405/37. C. salmantica L. Medit. Splott, 1927.

405/45. C. algeriensis Coss. & Dur. N. Africa. Splott, 1927.

406(2)/1. Tetramorphaea Belangeriana DC. Persia. Splott, 1936 (*Miss Todd*).

407/1. Carthamus lanatus L. Cardiff E., 1937.

407/3. C. tinctorius L. Occasionally found on rubbish-heaps.

416/10. Crepis taraxacifolia Thuill. Very common on railway banks, etc.

416/11. C. setosa Haller f. Europe. Persisted at Splott for several years, but not seen since 1936.

417/1. Tolpis barbata Gaertn. Europe. Barry, 1927.

420/2. Andryala integrifolia L. S. Europe. Cardiff N., 1938.

425/2. Lactuca Serriola L. Still at Barry Docks.

428/1. Tragopogon porrifolius L. Naturalised at Cardiff Docks and Barry Docks.

HYDROPHYLLACEAE.

488/1. Phacelia ciliata Benth. N. Amer. Porthcawl, 1938. Introduced with chicken-food.

488/4. P. tanacetifolia Benth. Cardiff N., 1938.

BORAGINACEAE.

493/2. Lappula echinata Gilib. Occasionally found as a grain alien.

494/1. Asperugo procumbens L. Splott, 1929.

496/4. Amsinckia intermedia Fisch. & Mey. Cardiff N., 1938.

500/1. Anchusa sempervirens L. Naturalised on roadsides in several places.

509/7. Echium humile Desf. N. Africa. Naturalised and increasing at Barry. Remains in flower for over six months.

SOLANACEAE.

516/1. Lycopersicum esculentum Mill. In abundance on every rubbish-heap.

517/15. Solanum Capsicastrum Lam. Brazil. Cardiff E., 1937.

517/16. S. ciliatum Lam. S. Amer. Cardiff S.W., 1930.

517/20. S. gracile Duval. S. Amer. Barry Docks, 1935 (*Mrs Sandwith*).

518/7. Physalis peruviana L. S. Amer. Cardiff S.W., 1937.

522/1. Datura Stramonium L. Appears in small quantity every year on allotments at S.W. Cardiff.

SCROPHULARIACEAE.

527/4. Verbascum virgatum Stokes. Still maintaining itself in its one locality in S.W. Cardiff.

527/8. V. nigrum L. The white-flowered form is still to be found in its original locality.

532/3. Linaria repens (L.) Mill. Still to be found in a few places but decreasing in quantity. The hybrid with *L. vulgaris* Mill. appears every year in one locality in S.W. Cardiff.

535/5. Scrophularia Scorodonia L. Quite established in one spot at Cardiff Docks.

535/8b. S. canina L. var. pinnatifida (Brot.). Established at Cardiff Docks for about 50 years.

537/2. Mimulus moschatus Dougl. N.W. Amer. Naturalised in a damp hollow a few miles north of Cardiff.

542/1. Erinus alpinus L. Europe. Appears most seasons on an old wall at Llandaff.

LABIATAE.

562/1. Satureia hortensis L. Europe. Splott, 1927.

566/12. Salvia sylvestris L. Naturalised in one locality at Barry Docks.

566/17. S. verticillata L. Naturalised in several places in the district.

570/3. DRACOCEPHALUM PARVIFLORUM Nutt. N. Amer. Splott, 1927.

577/8. STACHYS RECTA L. Thoroughly naturalised at Barry Docks.

578/1. GALEOPSIS SPECIOSA Mill. Appeared in abundance amongst potatoes on an allotment at N. Cardiff, 1935 and 1936. Not seen since.

PLANTAGINACEAE.

588/1. PLANTAGO INDICA L. Cardiff S.W., 1937. Now gone from Cardiff Docks.

ILLECEBRACEAE.

593/4. HERNIARIA CINEREA Lam. & DC. Europe. Splott, 1929.

594/1. CORRIGIOLA LITTORALIS L. Europe. Barry, 1927.

AMARANTACEAE.

596/2. AMARANTHUS HYBRIDUS L. N. Amer. Splott, 1926.

596/4. A. CHLOROSTACHYS Willd. A very frequent grain alien. Appears every year.

596/6. A. RETROFLEXUS L. A frequent grain alien.

596/9. A. ALBUS L. Almost as frequent a grain alien as 596/4.

596/11b. A. ANGUSTIFOLIUS Lam. var. POLYGONOIDES (Moq.) Thell. Europe. Splott, 1936.

596/15. A. VULGATISSIMUS Speg. Argentine. Cardiff E., 1937. Identified by Dr R. Melville as probably *A. vulgatissimus* Speg.

CHENOPODIACEAE.

600/4. CHENOPODIUM HYBRIDUM L. Of occasional occurrence as a grain alien.

600/5. C. URBICUM L. Cardiff E., 1937.

600/7. C. OPULIFOLIUM Schrad. Appears most years as a grain alien.

600/11. C. LEPTOPHYLLUM (Nutt.) Brit. Of occasional occurrence as a grain alien.

600/21. C. HIRCINUM Schrad. S. Amer. Splott, 1937.

602/1. ROUBIEVA MULTIFIDA Moq. Established at Barry Docks.

610/1. KOCHIA SCOPARIA (L.) Schrad. Europe. Cardiff S.W.. 1937.

POLYGONACEAE.

615/19. POLYGONUM PATULUM M. Bieb. An occasional grain alien.

615/32. P. CUSPIDATUM Sieb. & Zucc. Established in many places.

615/34. P. COMPACTUM Hook. f. Japan. Thoroughly established on an open piece of ground in the centre of Cardiff.

616/1. FAGOPYRUM ESCULENTUM Moench. A frequent rubbish-heap plant.

618/20(2). RUMEX GRAECUS Boiss. & Heldr. Europe. Established on a roadside, E. Cardiff. (See p. 148 below.—ED.)

618/21. R. BUCEPHALOPHORUS L. S. Europe. Barry, 1928.

618/24. R. CUNEIFOLIUS Campd. S. Amer. Cardiff Docks, 1927 (*Mrs Sandwith*). This is the dock established on the sand dunes at Kenfig.

SANTALACEAE.

627/1. THESIUM HUMIFUSUM DC. Established for many years at Barry Docks, but being gradually choked by larger plants.

EUPHORBIACEAE.

628/9. EUPHORBIA VIRGATA Waldst. & Kit. Gone from Radyr but still flourishing at Barry Docks.

628/10b. E. ESULA L. var. PINIFOLIA (Lam.) Druce. For many years at Cardiff Docks, but gradually dying out.

628/18. E. CERATOCARPA Ten. S. Europe. Naturalised at Barry Docks. Flowers every spring and autumn.

630/1. RICINUS COMMUNIS L. Barry Docks, 1937.

632/2. MERCURIALIS ANNUA L. Rather frequent on rubbish-heaps.

URTIOACEAE.

635/1. CANNABIS SATIVA L. Rather frequent on rubbish-heaps.

LILIACEAE.

702/16b. ALLIUM ROSEUM L. var. BULBIFERUM Kunth. Medit. Naturalised and increasing at Barry Docks.

704/1. HYACINTHUS COMOSUS L. Established at Barry Docks and at another spot on the Glamorgan coast. Flowers in May.

CYPERACEAE.

746/10. SCIRPUS HOLOSCHOENUS L. Quite established at Barry Docks, if not a native.

GRAMINACEAE.

754/1. PANICUM MILIACEUM L. A very frequent rubbish-heap plant.

754/6. P. COLONUM L. Medit. Cardiff N., 1938.

754/8c. P. CRUS-GALLI L. var. BREVISETUM Döll. A frequent grain alien.

754/8d. P. CRUS-GALLI L. var. ARISTATA S. F. Gray. Cardiff N., 1938.

754/8e. P. CRUS-GALLI L. var. MITE Pursh. Splott, 1937. Cardiff N., 1938.

754/10. DIGITARIA SANGUINALE (L.) Scop. Cardiff E., 1937.

756/1. SETARIA ITALICA (L.) Beauv. Europe. Cardiff S.W., 1937. Cardiff N., 1938.

756/2. S. VIRIDIS (L.) Beauv. Occasionally found as a grain alien. Var. MAJOR (Gaud.) Koch seems to be the common form of this species on rubbish-heaps.

756/3. S. GLAUCA Beauv. Occasionally found as a grain alien.

756/6. S. GENICULATA Beauv. Mexico. Cardiff N., 1938.

759/1. ZEA MAYS L. Frequent on rubbish-heaps.

763/2. SORGHUM HALAPENSE (L.) Pers. Reg. Calid. Cardiff E., 1937. Forma MUTICA (Hask.). Cardiff E., 1937. Cardiff N., 1938.

763/3. S. CERNUUM Host. Asia. Cardiff S.W., 1935 and 1937.

765/1. Phalaris minor Retz. Rather common as a grain alien.

765/5. P. canariensis L. The commonest of all rubbish-heap grasses. Never fails to appear.

765/7. P. paradoxa L. An occasional grain alien.

765/8. P. angusta Nees. N. Amer. Splott, 1927.

773/1. Piptatherum multiflorum (Desf.) Beauv. Established in small quantity at Barry Docks.

782/1. Polypogon monspeliensis (L.) Desf. Occasionally found as a grain alien.

782/2. ×P. littoralis (With.) Smith. Quite established at Cardiff Docks.

785/1. Apera Spica-venti (L.) Beauv. An occasional grain alien.

794/6. Avena strigosa Schreb. Occasionally found as a grain alien.

794/7. A. sativa L. A very common grain alien.

797/1. Cynodon Dactylon (L.) Pers. Naturalised on the river-bank in the centre of Cardiff.

808/1. Cynosurus echinatus L. An occasional grain alien.

815/1. Eragrostis cilianensis (All.) Lutati. Cardiff N., 1938.

815/2. E. poaeoides Beauv. Eur. Splott, 1930.

815/8. E. pectinacea (Michx.) Nees. N. Amer. Cardiff N., 1938.

827/1(2). Bromus Gussonei Parl. In some quantity on a roadside, Cardiff E., 1937.

829/2. Lolium temulentum L. An occasional grain alien.

831/1. Secale cereale L. An occasional grain alien.

832/11. Triticum cylindricum (Host) Ces. Pass. & Gib. Europe. Cardiff S.W., 1937.

NOTES ON THE ROSES OF BEDFORDSHIRE.

Edmund B. Bishop.

A few years ago Col. Wolley-Dod drew my attention to certain vice-counties from which he had not a single *Rosa* record, and urged me to take every opportunity of working in any of them. Bedfordshire (30) was one of these, and on my happening to mention this to Mr Hugh Phillips he undertook to do his best to help us, as he and his mother lived at Hitchin, only two or three miles over the county border. During 1936 and 1937 our kind friends made systematic explorations of the whole county, and obtained about 300 gatherings of Roses. These were all submitted to me and the present paper is the outcome.

Explanations are necessary as to various references, abbreviations, etc. Arrangement and nomenclature are (primarily) those of Col. Wolley-Dod's *Revision of the British Roses*, 1930, with a few subsequent published amendments thereto. Every British student of the genus should make this indispensable monograph the groundwork of his or her studies. It has, in so convenient a form, evolved reasonable order out of previous bewildering chaos. Whatever critical knowledge I have acquired of *Rosa* originated from the study of Wolley-Dod's publications, and has since been fostered by his patient help in countless diagnoses of gatherings made by my sister and myself—indeed I can never repay my debt to him. " W.-Dod " (or mere mention of locality without any comment) = as described by Wolley-Dod in his *Revision*.

Later on, it was Col. Wolley-Dod who introduced me to Keller's monumental work, which has now become to me almost a *Rosa* Bible. " Kell." = as described in Dr Robert Keller's *Synopsis Rosarum Spontanearum Europae Mediae* (Zurich, 1931), which contains full descriptions of more than 2600 varieties, forms and hybrids of Mid-European Roses. Even when due allowance be made for the much larger area covered by the *Synopsis* than that by the *Revision*, it is obvious that Keller carries splitting to a finer art than does Wolley-Dod, and consequently must be even more of an anathema to a rigid Benthamite. However, I am not prepared to argue that point here; it can be left to the personal idiosyncrasy of each student.

It must be understood that, although Col. Wolley-Dod has raised no objection to my naming of the more or less generally distributed varieties and forms, I have not cared just now to worry him over the more critical ones, consequently such are given on my own authority. As regards the " Kell." namings all are solely my own, as difficulties of transit and language (to say nothing of my reluctance to trouble Dr Keller in his now very advanced age) make any confirmation by him of such naming quite out of the question.

" Ref. No. —" = a particular number in my own herbarium.

Where, as in many cases, no "Kell." name is suggested, it may usually be understood that the " W.-Dod " name seems a fairly suitable one from the *Synopsis*, but not infrequently it implies that no "Kell." name seems to fit.

It must be explained that no variety or form has ever been included in Wolley-Dod's List of *Rosa* records, unless a specimen has been passed by him or by me. Of course, I am quite aware that Druce's *Comital Flora of the British Isles* records the occurrence in v.-c. 30 of six of the *aggregate* species mentioned in this paper, only one, *R. obtusifolia*, being new to it. The absence of *R. tomentosa* from the gatherings submitted to me is rather a surprise, though that species is not definitely recorded in *Comital Flora*.

Until quite recently I had no knowledge of any Flora of Bedfordshire, but early in 1939 I was able to inspect a copy of *The Field Flowers of Bedfordshire*, by James Saunders, A.L.S. (Luton, 1911). Herein I find the following species of *Rosa* recorded:—*arvensis*, *canina*, *dumetorum*, *tomentosa* and *rubiginosa*. The only varieties segregated therein are *lutetiana* and *sphaerica* (of *R. canina*) and *urbica* (of *R. dumetorum*). Most of these records seem to have been supplied by Rev. W. Moyle Rogers. Without doubt a detailed search through B.E.C. Reports and through files of the *Journal of Botany* would reveal many individual *Rosa* records, but such a task is beyond my powers just now.

R. arvensis Huds. (Agg.)	Clophill: towards var. *biserrata* Crép., but many leaflets uniserrate or intermediate, so safer under aggregate species (Kell., p. 133: var. *typica* R. Kell. f. *subbiserrata* Schwertchl.).
Var. *vulgaris* Ser.	Barton-in-the-Clay: a form with small leaflets and small fruit (Kell., p. 132: very near f. *parvifolia* Martrin-Donos). In more or less typical form, *vulgaris* occurs throughout the whole county.
f. *major* Coste	A rather weak form, actual locality not stated.
Var. *ovata* (Léj.) Desv.	Bromham. Colmworth: a multiflorous form, with some fruits subglobose or even globose (Ref. No. R.2103).
Var. *biserrata* Crép.	Barton-in-the-Clay. Marston Morteyne. Colmworth (Ref. No. R.2104). Felmersham.
Var. *gallicoides* (Déségl.) Crép.	Near Colmworth: excellent examples of this very striking variety, which is treated by Keller as a comprehensive aggregate, a view with which I am in accord (Kell., p. 137: I incline to place these specimens under var. *glandulosa* (Lloyd) R. Kell.) (Ref. No. R.2105).
R. stylosa Desv. (Agg.)	A gathering with very scanty fruit, actual locality not stated, seems to come under this species. Possibly it may be var. *virginea* (Rip.) Rouy, but the material is hardly good enough for a record.

Var. *systyla* (Bast.) Baker	Clophill: two gatherings ± typical, three others multiflorus (Kell., p. 166: under f. *fastigiata* (Bast.) R. Kell.). Colmworth: a small-leafleted form, with peduncles weakly glandular.
Var. *congesta* (Rip.) R. Kell.	Colmworth: two separate gatherings. Felmersham: two more separate gatherings. Wilden: very much weathered, of doubtful value. I have no hesitation in placing the Colmworth and Felmersham specimens under var. *congesta*. For first British record of this variety, see *B.E.C. 1937 Rep.*, 448-9. These further gatherings confirm my forecast as to the occurrence of var. *congesta* in Bedfordshire. In the Colmworth specimens only about 25 per cent. of the fruits have any trace of hispidity at bases of styles, whilst the Felmersham specimens have about 50 per cent. In all cases hispidity is weak, usually very weak. Obviously, these Bedfordshire gatherings represent a weaker form of var. *congesta* than those from v.-c. 28 described in *B.E.C. 1937 Rep.* But it must always be borne in mind that in *R. stylosa* the styles are almost invariably quite glabrous, the one and only exception recorded by Keller from the whole of Middle Europe being var. *congesta*, and that from Savoy alone. Consequently, even slight hispidity, which would be ignored in *R. canina*, is in *R. stylosa* of real importance.
R. canina L. (Agg.)	Near Colmworth (W.-Dod: perhaps under Group *Transitoriae*, but almost intermediate between that and Group *Dumales*. I cannot make it fit any var. or f. of either Group in *Revision*). (Kell., pp. 467-8: seemingly quite a fair fit for var. *transitoria* R. Kell. f. *heterophylla* R. Kell.) (Ref. No. R.2136).
Group *Lutetianae*.	
Var. *lutetiana* (Lem.) Baker	Barton-in-the-Clay: towards *sphaerica*. Bromham: towards *sphaerica*. Ampthill (Kell., p. 460: nearest f. *separabilis* (Déségl.) Rouy). Colmworth: a multiflorus form (Kell., p. 462: I think f. *elongato-ramulosa* R. Kell.) (Ref. No. R.2107). Felmersham (Kell., p. 460: perhaps f. *glaucescens* Desv.). Others: ± typical, in various parts of the county.
f. *lasiostylis* Borb.	Felmersham: quite characteristic (Ref. No. R.2108.)

Var. *sphaerica* (Gren.) Dum.	Barton-in-the-Clay. Bromham. Clophill (Kell., p. 462: seemingly best under f. *barbatostylis* R. Kell.) (Ref. No. R.2109.)
Var. *flexibilis* (Déségl.) Rouy	Colmworth (Kell., p. 458: a good fit for var. *lutetiana* f. *multiflora* Wirtgen).
Var. *senticosa* (Ach.) Baker	Barton-in-the-Clay. Bromham. Marston Morteyne. Colmworth.
f. *oxyphylla* (Rip.) W.-Dod	Aspley (Ref. No. R.2110).
f. *mucronulata* (Déségl.) W.-Dod	Woburn (Ref. No. R.2111).
Group. *Transitoriae.*	
Var. *spuria* (Pug.) W.-Dod	Marston Morteyne: probably *spuria*, a smallish form.
Var. *globularis* (Franch.) Dum.	Clophill (Ref. No. R.2112). Colmworth: may be *globularis*. Wilden: good, but a small form.
Var. *ramosissima* Rau	Specimens, best placed under this rather loosely-defined variety, were gathered in various parts of the county but, as usual, are all more or less unsatisfactory. Maiden Bower, near Dunstable (Kell., p. 468: in my opinion var. *transitoria* R. Kell. under f. *otoleia* (Rip.) Braun) (Ref. No. R.2113).
Group *Dumales.* (Agg.)	A gathering from near Ampthill, thought by Mr Hugh Phillips to be perhaps var. *medioxima* (Déségl.) Rouy, has some leaflets suborbicular, and several broadly ovate, whilst the remainder (about 50 per cent.) are better described as ovate. Careful comparison with the 10 sheets in the *medioxima* cover in my herbarium will not permit me to bring this specimen under that rare variety, though it does make some approach thereto. Even the most untypical of my specimens does not stray quite over the *medioxima* border-line, as does this Ampthill gathering. For the present I prefer to leave it under aggregate *Dumales*.
Var. *dumalis* (Bechst.) Dum.	Barton-in-the-Clay (Kell., p. 485: a reasonable fit for f. *laxifolia* (Borb.) R. Kell.). Bromham (Kell., p. 485: nearest f. *racemosula* Braun) (Ref. No. R.2114). Clophill (Kell.: perhaps nearest f. *laxifolia*). Ampthill.
f. *viridicata* (Pug.) Rouy	Barton-in-the-Clay. Colmworth. Bromham. Ampthill (Kell., p. 484: perhaps nearest f. *sarmentoides* Braun) (Ref. No. R.2138).
f. *cladoleia* (Rip.) W.-Dod	Many gatherings from various parts of the county. Barton-in-the-Clay (Kell., p. 480: (a) perhaps nearest f. *bicolor* R. Kell.: p. 481: (b) nearest f. *attenuata* Braun) (Ref. No. R.2139). Woburn (Kell., p. 480: a reasonable fit for f. *bicolor* R. Kell.).

Var. *stenocarpa* (Déségl.) Rouy	Barton-in-the-Clay (Kell., p. 481 : seemingly best under f. *conica* R. Kell.) (Ref. Nos. R.2118 and 2119). Ampthill. Felmersham (Kell., p. 481 : a fair fit for f. *suboblonga* R. Kell.) (Ref. No. R.2142). Woburn (Kell., p. 481 : f. *conica* R. Kell.) (Ref. No. R.2120).
Var. *Carioti* (Chab.) Rouy	Clapham. Ampthill. Maiden Bower, near Dunstable. Bromham. These last three all unsatisfactory specimens.
Var. *fraxinoides* H. Br.	
f. *recognita* Rouy	Aspley.
Var. *sylvularum* (Rip.) Rouy	Several gatherings, from various parts of the county.
f. *adscita* (Déségl.) Rouy	Aspley Guise. Bromham.
Group *Andegavenses.*	
Var. *andegavensis* (Bast.) Desp.	Turvey. Wilden : with some peduncles glandular and some eglandular. (Passed by W.-D. as *andegavensis.*) (Kell., p. 463 : clearly under an aggregate var. *edita* (Déségl.) Rouy, a weak growing and weakly-armed form, which I cannot fit under either of its four named formae) (Ref. No. R.2121).
f. *agraria* (Rip.) W.-Dod	Colmworth : four separate gatherings, all of practically identical form. (W.-Dod : under *agraria*. Further, all these specimens have been submitted to him and confirmed as such). (Kell., p. 463 : quite clearly under var. *edita* (Déségl.) Rouy f. *mollardiana* (Moutin) Rouy) (Ref. No. R.2122). It must be noted that Keller's *primary* distinctions between vars. *edita* (and its formae) and *andegavensis* (and its formae) are as follows :—The former " *Pedunculorum pars glandulis stipitatis obsita, altera pars nuda*;" the latter " *Omnes pedunculi ± dense hispido-glandulosi.*"
Var. *verticillacantha* (Mér.) Baker	Exact locality is not stated.
f. *clivicola* Rouy	Wyboston (Kell., p. 475 : I think under var. *diversiglandulosa* R. Kell. (as agg.)). Maiden Bower, near Dunstable (Kell., p. 475 : I think nearest var. *diversiglandulosa* R. Kell. (as agg.)) (Ref. No. R.2124). Bromham (Kell., p. 491 : var. *adenocalyx* R. Kell. f. *glaucophylla* R. Kell.) (Ref. No. R.2144).
Group *Scabratae.*	
Var. *Blondaeana* (Rip.) Rouy	Between Wilden and Colmworth.

Intermediate between *R. canina* L. and *R. dumetorum* Thuill. (So I prefer to regard these gatherings)	Between Clophill and Bedford (Kell., p. 463: I think under *R. canina* L. ssp. *R. vulgaris* Gams var. *hispidula* (Rip. p.p.) Chr.). Actual locality not stated; petioles pubescent, but pubescence only rarely extends by even a few hairs to midribs.
R. dumetorum Thuill. (Agg.)	(W.-Dod: I cannot segregate either of the three undermentioned gatherings, so will leave each as aggregate). Maiden Bower, near Dunstable (Kell.: possibly it may be brought under var. *subglabra* (Borb.) R. Kell., as agg., but untypical). Woburn (Kell., p. 548: under var. *subglabra* (Borb.) R. Kell., seemingly nearest f. *uncinelloides* (Pug.) Braun). Near Colmworth (Kell., p. 549: var. *subglabra* (Borb.) R. Kell., a fair fit for f. *peracuta* Braun) (Ref. No. R.2253).
Var. *typica* W.-Dod	Marston Morteyne: two separate gatherings seemingly of same form, which may pass as var. *typica* W.-Dod, but certainly not extreme (Kell., p. 543: var. *Thuilleri* Chr., a fair fit for f. *leptotricha* Borbás). Bromham: two gatherings, in flower and fruit respectively, very likely from same bush (W.-Dod: I think best under var. *typica*, a sub-biserrate, smallish-leafleted, densely-armed form) (Kell., p. 551: I make it var. *lembachensis* (J. B. v. Kell.) R. Kell., *sens. lat.*, but cannot segregate further under any named form).
f. *urbica* (Lem.) W.-Dod	About 20 gatherings in all, from various parts of the county. Flitwick: making considerable approach (in pubescence) towards *typica*, *sens. str.*: with multiflorous inflorescence, and long remarkably pinnate sepals (Kell.: I incline to place it under var. *Thuilleri* Chr., but cannot segregate further: a very interesting Rose) (Ref. No. R.2115). Felmersham: a little towards *typica*, *sens. str.* (Kell., p. 540: a fair fit for var. *platyphylla* (Rau) Chr. f. *peropaca* (Braun) (Ref. No. R.2125).
f. *semiglabra* (Rip.) W.-Dod	Marston Morteyne. Colmworth.
Var. *ramealis* (Pug.) W.-Dod	
f. *urbicoides* (Crép.) Braun	Flitwick (Ref. No. R.2126). Wilden (Ref. No. R.2127). Felmersham.

Var. *Gabrielis* (F. Gér.) R. Kell.	Ten gatherings from various parts of the county, often, as is usual in this variety, more or less untypical and doubtful. Flitwick Moor: quite a fair fit (Ref. No. R.2116).
Var. *calophylla* Rouy	Flitwick: nearest *calophylla*, and may just pass. Woburn: perhaps nearest *calophylla*, but doubtful.
Var. *platyphylla* (Rau) W.-Dod	Fifteen gatherings from various parts of the county. Ampthill (Kell., p. 549: var. *subglabra* (Borb.) R. Kell. f. *jactata* (Déségl.) Rouy). Shefford (Kell., p. 551: perhaps var. *hirtifolia* Braun f. *perciliata* Braun) (Ref. No. R.2117). Woburn (Kell: a fairish fit for var. *hirtifolia* Braun (agg.)) (Ref. No. R.2145). Colmworth (Kell., p. 552: perhaps nearest var. *incanescens* Braun, but hardly a good fit) (Ref. No. R.2146). Clapham (Kell., p. 550: var. *hirtifolia* Braun f. *rivularis* (Braun & Borb.) Braun) (Ref. No. R.2147). It must be borne in mind that Keller's "var. *platyphylla* (Rau) Chr." is far from being synonymous with var. *platyphylla* (Rau) W.-Dod.
Var. *sphaerocarpa* (Pug.) W.-Dod f. *spinetorum* (Déségl. & Ozan.) W.-Dod	Shefford: a multiflorous form (Kell., p. 549: I think best under var. *hirtifolia* Braun (agg.), but (see p. 539) not impossible under var. *platyphylla* f. *spinetorum*) (Ref. No. R.2128). Clapham (Kell., p. 550: seemingly a fair fit for var. *rodanensis* Schwertschl.). Felmersham: (a) an even better fit for var. *rodanensis*: (b) and (c) also *rodanensis*: (d) under an agg. var. *hirtifolia*.
Var. *hemitricha* (Rip.) W.-Dod	Clophill (Kell., p. 554: a good fit for f. *affinitata* Braun). Ampthill (Kell., p. 555: (a) quite a reasonable fit for f. *quadica* Braun (Ref. No. R.2129): (b) a form with unarmed stems and branches, and thin-textured leaflets (Ref. No. R.2130)).
R. obtusifolia Desv.	
Var. *tomentella* (Lém.) Baker	About 20 gatherings from various parts of the county. Woburn (Kell., p. 425: a fair fit for var. *Longae* Cornaz). Near Colmworth: (a) with some leaflets larger than usual, and more subfoliar glands (Kell., p. 429: var. *pycnocephala* (Chr.) R. Kell., seemingly a good fit for f. *transsilvanica* R. Kell.) (Ref. No. R.2132): (b) a largish form, making slight approach to var *Borreri*). (Kell., p. 423: near f. *sinuatidens* Chr.) (Ref. No. R.2131). Marston Mor-

	teyne (Kell., p. 424: under f. *recti-spina* R. Kell.) (Ref. No. R.2148). Shelton: with variable styles, subglabrous to weakly or even decidedly hispid (Kell., p. 424: nearest f. *esinensis* R. Kell.) (Ref. No. R.2149). Between Bedford and Colmworth: with only about 25 per cent. of its fruit well-formed; also, leaflets are variable as regards quantity of pubescence and number of subfoliar glands. In these circumstances, whilst leaving under var. *tomentella* for the present, I incline strongly to suspect that it is a hybrid thereof.
Var. *Borreri* (Woods) W.-Dod	Maulden (both W.-Dod and Kell.).
Var. *capucinensis* R. Kell.	Four gatherings, all apparently from within a few miles radius, seem to come under this variety, which has not yet been recorded from Britain. My report thereon, after careful examination, is much too long to be included in this paper. Circumstances have prevented me from submitting this and other critical material to Col. Wolley-Dod, consequently, until I can get his opinion, it is advisable to keep any definite naming in suspense, however confident I may feel. To put it briefly, these gatherings are strongly suggestive of *Rothschildii*, but are *minus* the vital key characters of that variety—acicles on flowering branches and glands on peduncles. Their chief departure from *capucinensis* is that their leaflets are (on average) larger, usually much larger than "± 23 mm. longa et ± 10-15 mm. lata," the size of *capucinensis* leaflets, as described by Keller, p. 435. But it seems to me, from the sentence of Wolley-Dod in his *Revision*, p. 73, lines 27-28, "Keller thinks this variety (i.e. *Rothschildii*) is very near his *R. obtusifolia* var. *capucinensis*," a reasonable assumption that Keller would not have rejected our specimens on account of size of leaflets, seeing that *Rothschildii* normally has leaflets at least as large as those now under consideration. Anyhow, we will leave these gatherings as probably *capucinensis*, subject to future confirmation.
Var. *Rothschildii* (Druce) W.-Dod ..	Five gatherings from about Colmworth: are all clearly this variety, though not extreme. I am indeed pleased, but not surprised, at its discovery in v.-c. 30. It has already

	been found in the adjacent v.-cc. 24, 31, and 32, also in 53 and 55 (Rutland), Mrs C. L. Wilde being the first to record it from the two last-mentioned. This glorious Rose, always associated by us with its discoverer, is obviously a true native of the Eastern Midlands, and seems specially at home in the north-east corner of Northamptonshire. Probably its correct status is that now accepted, but small wonder is it that Druce in his enthusiasm gave it specific rank (Ref. No. R.2134).
R. rubiginosa L.	
Var. *typica* W.-Dod.	Near Bromham: making a slight approach towards *echinocarpa*, but not that var.
Var. *echinocarpa* (Rip.) Gren.	Near Bromham (Kell.: I think the echinate characters much exceed those of var. *umbellata* (Leers) Dum. f. *echinocarpa* (Rip.) Dum., as described in *Synopsis*, p. 349. In my opinion, this is better under f. *horrida* Lange, pp. 350-1) (Ref. No. R.2135).
R. micrantha Sm.	
Var. *typica* Chr.	Barton-in-the-Clay.

Since my sister and I, throughout the course of our now lengthy lives, have tramped and botanised in all but two of our English counties, it seems strange that so readily accessible a county as Bedfordshire should have been almost neglected by us. Not quite neglected, as a few days spent round Dunstable, in May 1913, did give us some slight idea of its floral possibilities, but that visit took place far too early in the year for Roses. Of course we have often traversed the county by road and rail, but never again was there any opportunity for serious botany. The more cordially welcome therefore was the bountiful harvest of Roses provided for us by the ungrudging labours of Mrs Phillips and Mr Hugh Phillips.

GALINSOGA QUADRIRADIATA Ruiz and Pav. IN BRITAIN.

J. P. M. BRENAN.

Galinsoga quadriradiata Ruiz & Pav. var. *hispida* (DC.) Thell. (see p. 44 above) resembles *G. parviflora* Cav. in habit and general appearance but may be distinguished from it by the following characters:—*Stem* more or less pilose, upper part of stem and pedicels more or less thickly clothed with multicellular, spreading, flexuous, simple, and glandular hairs, 0.5 mm. long or more. *Receptacle-scales* not trifid, serrate towards their apices. *Pappus-scales* of tubular flowers fimbriate on their margins, the longer ones on each achene attenuate towards the tops and prolonged into distinct aristas, the shorter ones acute or obtuse, the longest ones usually shorter than the achene but sometimes longer, and also shorter than the corolla: those of the ligulate flowers similar but shorter.

G. parviflora Cav. has the *stem* glabrous or subglabrous, the pedicels clothed with short, ascending, simple hairs less than 0.5 mm. long, usually intermixed with spreading glandular ones. *Receptacle-scales* usually trifid. *Pappus-scales* of tubular flowers fimbriate at the margins, obtuse to acute, not aristate at the apex, as long as the achene, usually more or less equalling, or longer than, the corolla: those of the ligulate flowers very short, about ¼ the length of the achenes.

G. quadriradiata var. *hispida*, which is a native of S. America from Mexico to Chile, has been known for some time as an adventive on the Continent. It has been recorded from France, Belgium, Germany, Austria, Switzerland and Poland, and is apparently a common weed in the Eastern United States. It has been overlooked hitherto in Britain and a careful examination of plants labelled as *G. parviflora* will most likely reveal further localities in addition to those given below.

The related *G. quadriradiata* var. *quadriradiata* (Ruiz & Pav.) Thell. (*G. hispida* Benth., *non* DC.) has very short non-aristate pappus-scales in the tubular flowers, about half as long as the achene and rarely more than half as long as the corolla. The ligulate flowers vary from white to purple (forma *purpurascens* (Fenzl) Thell. = *G. hispida* Benth. f. *purpurea* Fenzl = *G. brachystephana* Regel). Under the var. *quadriradiata* Thellung includes the forma *Vargasiana*, which has the pappus-scales similar in size but aristate. Mosseray, *Bull. du Jard. Bot. de l'Etat, Bruxelles, 14*, fasc. 3, 326 (1937), proposes that the var. *quadriradiata* should be restricted to those plants with very short, non-aristate pappus-scales, while those with the scales aristate would come under var. *hispida*, of which f. *Vargasiana* would be a form with abbreviated scales. This seems to be a more satisfactory arrangement than that of Thellung. Examination of a large series of specimens will be necessary to ascertain whether the f. *Vargasiana* merely represents the extreme of a continuous linear series of variations in reduction of pappus-scale length from var.

hispida, in which case it would be unworthy of retention. For the present, at any rate, it is kept apart.

G. quadriradiata var. *quadriradiata* (including f. *Vargasiana*) has been recorded from Germany as an adventive, and the f. *Vargasiana* under similar conditions from Belgium.

I have seen specimens of var. *hispida* and f. *Vargasiana* from the following localities in Britain:—

Var. *hispida* (DC.) Thell.

11, S. Hants.; Mudeford, 1931, Miss MARGARET CAMPBELL (in Hb. Druce).

18, S. Essex; Dagenham, June 27th, 1937, Mrs SANDWITH, N. Y. SANDWITH, A. H. G. ALSTON and J. P. M. BRENAN (in Hb. Brenan).

34, W. Gloster; tip near Bristol, September 1938, Mrs SANDWITH (sp. comm. Mrs Sandwith).

41, Glamorgan; Leckwith, August 25th, 1922, R. L. SMITH (Hb. Druce).

Forma *Vargasiana* (Thell.) Mosseray.

34, W. Gloster; Avonmouth, July 24th, 1927, Mrs SANDWITH (in Hb. Sandwith and Hb. Kew): cult. Tickenham from this locality, September 26th, 1927 (in Hb. Druce).

My most grateful thanks are due to Mr J. Chapple for facilities and kindly help given in the consultation of the material in Hb. Druce, and to Mrs Sandwith and Mr N. Y. Sandwith for much generous assistance.

NOTES ON MELAMPYRUM.

C. E. Britton, A.L.S.

1. Dubious and Other Records.

In the *Journal of Botany*, 1929, pp. 105-7, the late C. E. Salmon gave the results of an examination of *Melampyrum* specimens by Dr v. Soó, the author of a recent Monograph on the genus. Several names unfamiliar to British botanists were brought to notice, which will be dealt with under the respective species.

M. arvense L.

Under this a subspecies *pseudobarbatum* (Schur) Wettst. is recorded from the Isle of Wight, " field above St Lawrence, abundant, 1900." I fear that the word abundant can only refer to the species in general, for Salmon's plants in the Herbarium of the British Museum do not support the statement referred to. There are three examples collected by Salmon at the locality and on the date in question. One is definitely identified by Soó as subsp. *pseudobarbatum*, a second is noted as approaching that subspecies, and the third, a much less robust plant, does not seem to have been submitted to Soó.

It is probable that the locality of St Lawrence has been more often resorted to for the collection of *M. arvense* than any other known locality, and consequently plants from that neighbourhood are frequent in herbaria. A study of this material has led to the conclusion that the reputed subsp. *pseudobarbatum* is no more than an exceptionally luxuriant plant with long arcuate branches, c. 30 cm. in length, which are again branched, and with two pairs of distant intercalary leaves.

Pseudobarbatum, regarded as species or subspecies, is one of the many instances in *Melampyrum* where a name of long standing has been taken by later authors and characters associated with it that certainly escaped the notice of the original author of the name, for to Schur, who described it in *Enum. Pl. Transs.*, 506 (1866), it differed from *M. arvense* by the slender habit, linear-lanceolate leaves, pale-green or light-yellow bracts, whereon the usual punctuations were absent, and pale-yellow, not rosy, corolla. Beck in *Fl. N.Ö.*, II, 2, 1070 (1893), placed *M. pseudobarbatum* as a form of *M. arvense* with white or yellow flowers and pale-yellow bracts. The wider application of the name is due to Wettstein, who extended it to a form common in the Siebenbürgen. Beauverd referred to var. *impunctatum* Godron plants that authors name *pseudobarbatum*. This variety was defined by Godron, *Fl. Lorr.*, 233 (1843), as possessing greenish-yellow bracts devoid of black glands, calyx teeth short, and wholly yellow, not purple, corollas. Plants with these characters appear to be unknown in Britain. On the whole, it may be said that in England communities of *M. arvense* include individual plants that approach the subspecies *arvense*, *Schinzii* and *pseudobarbatum* without satisfactorily meeting the requirements of the authors' diagnoses.

M. cristatum L.

This species, in Britain, is also of mixed characters, i.e. characters are present that characterise the subspecies *Ronnigeri* (Poeverl.) and *typus* of v. Soó. Plants with the many-noded stem of subsp. *cristatum* do not exhibit the 4-5 pairs of intercalary leaves that should accompany that feature. The intercalary leaves are absent or consist of 1 pair, rarely 2 pairs. Whilst it may be possible to pick out individual plants and refer them to subsp. *Ronnigeri*, such plants appear to be exceptional. This last-mentioned form, recognised by v. Soó from localities in East Anglia, has not been distinguished by Beauverd amongst examples of *M. cristatum* submitted by Druce and the writer.

M. silvaticum L.

The variations of this species in Britain and Ireland are very imperfectly known. Salmon obtained from v. Soó the name of subsp. *subsilvaticum* for plants from Yorkshire and Durham, and expressed the opinion that the ordinary British plant appeared to be this subspecies. With this conclusion I am in full agreement, but the name cannot be applied to cover all British forms. *M. subsilvaticum* Ronn. & Schinz in Schinz & Keller, *Fl. Schweiz*, 3rd ed., II part, 303 (1914) = *M. intermedium* Ronn. & Schinz in Schinz & Keller, *Fl. Suisse*, ed. 3, 521 (1909), non *M. intermedium* Perr. & Song., in *Bull. Herb. Boiss.*, 426-427 (1893), the latter belonging to the species *M. nemorosum* L. Beauverd referred *M. subsilvaticum* to var. *edentatum* Schur, and to the sub-vars. *nephelobium* and *dubium*. As plants of Druce were identified by Beauverd with the first two of these names, subsp. *subsilvaticum* was no real addition to the British list. There are, however, plants in Herb. Mus. Brit. to which it is desirable to draw attention in the hope that such forms may again be collected and carefully studied. Field notes as to the colour of the corolla would be useful. A large plant (20-30 cm.), with 1 pair of erect-ascending branches arising from the second node, cauline leaves 40 × 5 mm., bracts 50-60 × 12 mm., the lower entire, upper bidentate at base, ovate-lanceolate, inflorescence commencing at node 3, was collected by F. Arnold Lees by the Tees, half-a-mile above Middleton Bridge, Durham; noted as "large and succulent." Somewhat similar plants have been gathered at Errigal Banks, Co. Derry, and at Crowglen, Co. Antrim. Another striking form from Glen Roy has long arcuate branches, entire leaves and bracts, and intercalary leaves.

M. pratense L.

Subsp. *oligocladum* (Beauv.) Soó.

Identified from gatherings made at Unwell Wood, Berks., and near Mallaranny, Co. Mayo. With these determinations by v. Soó may be associated plants gathered many years ago by A. O. Hume at Trelawney Woods, W. Looe, Cornwall. This appears to be a form with well-marked characters, and a short description is given of the Cornish plant. Stem 18-25 cm., stout, branches two pairs, arising from cotyledonary node and succeeding node, cauline leaves one pair, rather broad, intercalary leaves absent or rarely 1 pair; inflorescence commencing at node 3 (rarely 4), lower bracts entire, median coarsely dentate, apical pectinate dentate. It is *M. pratense* L. subsp. *vulgatum* (Pers.) Beauv. var. *oligocladum* Beauv. British plants approach sub-var. *platyphyllum* Beauv.

" Subsp. *hians* (Druce) Beauv."

Under this v. Soó placed plants from Yorks. as f. *britannicum* Beauv. This combination is unknown to the latter author, whose var. *britannicum* is placed in the vicinity of vars. *oligocladum* and *commutatum*. The British plants recognised by Beauverd have little affinity to Druce's *hians*.

2. THE COW-WHEATS OF JOHNSTON'S " FLORA OF BERWICK-UPON-TWEED."

To Dr G. Johnston may be given the credit of being the first amongst British botanists to recognise the polymorphism existing in *M. pratense*, for in his published works the author plainly showed an acquaintance with the existence of three or four forms in the area covered by his investigations, and his critical acumen established that his *M. pratense* was not identical with the plant of the same name described by Smith and illustrated in *E.B.*, t. 113. It was in the *Flora of Berwick-upon-Tweed*, 1829-30, that Johnston described two species diagnosed in the following terms:—

" 1. *M. pratense*, leaves lanceolate, floral ones toothed at the base; flowers axillary in partly distant pairs, turned to one side; corolla four times as long as the calyx, closed, lower lip direct."

" 2. *montanum*, leaves linear, floral ones quite entire; flowers axillary, in partly distant pairs, turned to one side; corolla about twice as long as calyx, lip direct (nova species). Hab. On the south-east side of Cheviot, plentiful."

After describing his new species in detail, Johnston immediately cast doubt upon its distinctness, for he wrote:—" It is not without hesitation that I give this [*M. montanum*] as a species from the preceding [*M. pratense*] since the differences may be attributed to situation, for we know that an alpine station does alter the aspect to a considerable extent." Further on, he wrote:—" And were the objection valid we might expect the plant at the base of the hill [Cheviot] to be much in its usual state and gradually diverging from it as it attained higher limits; but this was not the case, for it was very uniform in character over a surface of many acres." In the appendix to the " Flora," Johnston receded further from his first estimate of the Cheviot plant, and may be said to have withdrawn his new species, for under *M. pratense* are the words: " My *Mel. montanum* (Vol. I, p. 136) I am now satisfied is only an alpine state of this. It may be found in profusion on Hedgehope, one of the Cheviots, and on Hepburn Hill at Chillingham, but, in the latter station, the plant begins to assume the appearance of the true *pratense*." In the *Botany of Eastern Borders*, 1852, 2 vols., Johnston gave another grade to the plant, for here he referred to it as "the variety β *montanum* (=*M. montanum* Berwk. Flora)."

Johnston's species or variety is probably better known from the terse characters given in the national floras, for but few botanists can have had access to the works of Johnston, and fewer still have seen authentic specimens, i.e., plants gathered and identified by Johnston. It was ascertained that the Berwickshire Naturalists' Club claimed to be in possession of the herbarium of the author of the *Flora of Berwick-upon-Tweed*, and by the aid of Mr J. B. Duncan, an officer of the Club, the Melampyrums were received for inspection, but unfortunately *M. montanum* was absent. However, opportunity was afforded of ascertaining the character of *M. pratense* of the "Flora." There are two plants under this name. That marked (1), from Houndwood, Berwickshire, is probably, perhaps certainly, the *M. pratense* of the "Flora," wherein it is stated that it "grows very abundantly in the woods between Houndwood and the Pease-bridge." It is added, "but in no part of Berwickshire have I observed it to attain the size of the plant figured in Eng. Botany and which I have gathered in the woods at Roslin. Our plant is rarely above 6 inches, bushy, with narrow linear leaves and very often with entire bracts." Comparison has been made of the Houndswood specimen and the representation of *M. pratense* in *E.B.*, t. 113, with the result that the conclusions expressed appear justified. The specimen of *M. pratense* numbered (2) was gathered at Hepburn, Northumberland, and is a slender plant compared with (1), but is essentially the same form. It is probably the plant previously mentioned from Hepburn Hill as a form of *M. montanum* tending towards the true *M. pratense*.

Authentic specimens of *M. montanum* are poorly represented in herbaria. It is not to be found at Kew and but one example has been seen at South Kensington. Information was received of two sheets of this plant, collected by Johnston, being in the possession of a local northern Natural History Society, but, as a loan of these was refused, opportunity was denied of comparison with plants elsewhere. By the courtesy of the Regius Keeper, Royal Botanic Garden, Edinburgh, the examples of Johnston's plant contained in the Herbarium were received for study. There are two examples collected by Johnston on the Cheviot Hills, and from these, and from another authentic specimen in Herb. Boswell Syme, the following description has been drawn up. Plant c. 15 cm., minutely hispid. Hypocotyl 7 mm., stem slender, 0.75 mm. diam., internodes 12-20 mm. Cotyledons oblong-lanceolate, 15 × 3 mm., cauline leaves 1 pair, linear, 25 × 2 mm., intercalary leaves 1-2 pairs, linear or linear-lanceolate, erect, 22-26 × 2-3 mm. Branches 2 pairs, those from the axils of cotyledons arrested, sterile, or elongating and flowering, upper pair of branches ascending-erect, or spreading, simple or branched, equalling stem or not. Inflorescence commencing at nodes 4-5; bracts quite entire, erect or spreading, exceeding flowers, these 12 mm., calyx-tube 2-3 mm., teeth 3-4 mm.

Distribution imperfectly known. As the Cheviot plant can scarcely be maintained as a species, when relegated to a lower grade, it should be cited as var. *montanum* Bab., *Man. Brit. Bot.*, 220, 1843.

3. M. PRATENSE L. VAR. ERICETORUM D. OLIVER IN PHYT., 678, 1852.

In passing, it may be said that *M. pratense* of the *Flora of Berwick-upon-Tweed*, judging from Johnston's plants, is this variety. As Oliver's var. is not well known, a detailed description of a type-specimen in the Herbarium, Royal Botanic Garden, Edinburgh, is given. It is labelled "*Melampyrum prat. ericetorum* mihi," with the locality "Urrisbeg, Galway, 8-52." Plant 22 cm. Stem erect, 1-1.5 mm. diam., inclined above, nodes 15-20 mm. distant. Cotyledonary node bare, 2nd, 3rd, and 4th nodes with erect-ascending branches, 65-90 mm., the lowest sterile, the two upper pairs with flowers towards apices; cauline leaves linear, 40 × 3.5 mm., erect or spreading; intercalary leaves 2 pairs, 35 × 4 mm., lanceolate-linear, erect. Inflorescence commencing at node 7, lower bracts entire, linear-lanceolate, 25 × 5 mm., erect, upper bracts lanceolate, with 1 or 2 pairs of linear acute lobes above the base. Flower 12 mm., calyx-tube 3 mm., teeth 3 mm. Shortly but conspicuously hispid in all parts.

THE BRITISH SPECIES OF UTRICULARIA.

P. M. Hall, F.L.S.

(An abridged version of this paper was read at the Annual General Meeting of the Society on March 15th, 1939.)

The title of this paper may be to some extent misleading since it is not my intention to give here a complete survey of the British members of the genus, so much as to indicate the nature of the problems arising from such a survey and to suggest solutions for some of them. Detailed descriptions of the British plants are already available and it would be superfluous to do more than point out such corrections or emendations as may be necessary for better understanding. Neither is it necessary to add to the existing accounts of the anatomy of these most interesting plants and of the functions of their various organs.

In order to write the account of this genus for the forthcoming New Students' Flora, it was necessary to satisfy oneself first as to the number of species occurring in Britain, then to settle any difficulties of nomenclature which might arise, and finally to investigate the distribution of each species in Britain by the examination of as much fresh and dried material as possible. To examine the whole of the herbarium material in this country alone of even such a small group as this is a formidable undertaking and on account of various hindrances this has as yet been only partially completed, but sufficient has been done to indicate what are the problems of taxonomy, nomenclature and distribution which arise in this genus.

According to modern British handbooks, e.g. Druce (1928), we have six British species:—

1. *vulgaris* L.
2. *major* Schmidel.
3. *intermedia* Dreves & Hayne.
4. *ochroleuca* Hartman.
5. *minor* L.
6. *Bremii* Heer.

[Druce also includes in his arrangement one doubtful hybrid, ? *intermedia* × *minor*.]

This arrangement is based upon the account of the genus in *B.E.C. 1910 Rep.*, 511-520 (1911): this account was drawn up by Druce from the writings of Glück and Meister supplemented by " verbal statements made to me by Dr Glück." This paper has formed the taxonomic basis for the genus in all subsequent accounts by British authors, e.g. Wilmott (1922), Butcher (1930), Praeger (1934), and Rendle (1937). The reservation must be made, however, that Butcher and Rendle make no reference to *U. Bremii*, while the other two authors only do so in consequence of and relying upon Glück's determination of Druce's gathering from the Gap of Dunloe.

On the Continent also the same arrangement has been followed by, among others, Rouy (1910) and Hegi (1918).

For reasons which will be given later I propose that the genus *Utricularia* in Britain be restricted to four species, as follows:—

1. *vulgaris* L.
2. *neglecta* Lehm.
3. *intermedia* Hayne.
4. *minor* L.

NOMENCLATURE.

The nomenclature of the British species fortunately raises only two problems. Two of our species, *U. vulgaris* and *U. minor*, were recognised by Linné in *Spec. Plant.*, ed. 1 (1753). There are specimens of both in Linné's herbarium at Burlington House; in Jackson's *Index* both are numbered " 1," indicating that they were in the herbarium before 1753; both agree with the diagnoses and both would therefore appear to be type-specimens. [In the case of the sheet of *U. vulgaris* " Utricularia " appears at the top of the sheet in faded ink, which according to Mr S. Savage indicates that the sheet was incorporated in the herbarium at an early date.] Moreover, both specimens unquestionably agree with our own understanding of these two names, which are therefore free from complications of any kind.

U. neglecta J. G. C. Lehmann, *Novarum et minus cognitarum stirpium pugillus* I. (Index Scholarum in Hamburgense Gymnasio Academico anno 1828, p. 38) (1828). I adopt this name in preference to the earlier name, *U. major* Schmidel, *Icones Plantarum* (1762), which has been adopted by many authorities The citation of *U. major* is usually to *tab.* xxi of that work and in fact there does not appear to be a diagnosis, recognisable as such, of the species in the text, although there are references to " Utricularia major." The legend of the plant reads " Utricularia minor Linn. et majoris fructificatio (fig. a-l)," the principal contents of the plate portraying *U. minor* L., while certain figures lettered " a " to " l " refer to " U. major." Schmidel clearly intends to contrast his " major " with Linné's *minor* illustrated in the same plate. Moreover, one of the figures, we are told, shows the flower in natural size (" mole naturali ") and since the labellum in this figure measures only 12 mm. × 12 mm. it is impossible that this should represent a normal flower of the species to which this name has been attributed. It is difficult to say to what species this figure and the others refer but it is quite possible that it represents *U. intermedia*. In any event, even if Schmidel gave a recognisable diagnosis, his name would be invalid for the reason that in *Icones Plantarum* he does not systematically and consistently use the binary system of nomenclature. Any names proposed by him are therefore invalid in accordance with Article 68 (4) of the International Rules of Nomenclature.

U. intermedia Hayne. This name is sometimes cited as of Dreves and Hayne, e.g. by Druce, *loc. cit.*, and by Bennett (1910). The correct citation would appear to be as of F. G. Hayne in Schrader's *Journal für die Botanik*, Erstes Stück, pp. 18-19, and *tab*. v (1800). The name is also sometimes cited as of A. G. Roth, *Catalecta botanica*, Fasc. secundus, p. 1 (1800), but reference to the text shows that Roth had no intention other than to give all credit to Hayne for the naming and description of this species.

KEY.

- A. Shoots of one form only, green floating leaves furnished with numerous bladders.
  - I. Lower lip of flower with deflexed margins; pedicels short and stout: fruiting freely. .... 1. *vulgaris* L.
  - II. Lower lip of flower expanded, undulate; pedicels long and slender; fruits very rarely formed. .... 2. *neglecta* Lehm.
- B. Shoots of two forms (a) green floating (or terrestrial) leaves, (b) specialized colourless (subterranean) shoots bearing bladders only.
  - I. Bladders practically confined to colourless shoots, rarely occurring among green leaves; flowers large, bright yellow, with long subulate spur; winter buds hairy. .... 3. *intermedia* Hayne.
  - II. Bladders occurring on both types of shoots; flowers small, pale sulphur-yellow with short spur; winter buds glabrous. .... 4. *minor* L.

U. vulgaris L. and U. neglecta Lehm.

The first problem which arises in connection with the identification of the British species is the discrimination between *U. vulgaris* L. and *U. neglecta* Lehm. and the limitation of their respective geographical distributions. The difficulty arises principally from the well-known fact that the members of this genus, in Europe at least, are very shy flowerers: though widely distributed, the localities in which any of the species flower are greatly outnumbered by those in which they seldom or never flower. In the case of barren plants I am of opinion that it is not possible to separate these two species in the present state of our knowledge. The text-books give various characters by which the foliage alone may be identified, relative coarseness in *U. vulgaris* contrasted with slenderness in *U. neglecta*, bladders of larger dimensions in one species and smaller in the other, and so on, but carefully selected material shows that the characters of the foliage and bladders are very variable and appear to be influenced by such matters as light, depth of water and no doubt also the chemical analysis of the water, as well as the content of organic matter.

Linton (1894) in a most valuable paper gives a hint which promises to be helpful when he refers to a statement by Reichenbach (1824) to the effect that the serrations of the young leaves of *U. vulgaris* bear a fascicle of bristles, while those of *U. neglecta* have but a single bristle and it is doubtful whether even the single bristle is always present. Although Linton said of this alleged distinction that he had not succeeded in verifying it or finding it confirmed by other observers, it appeared to be at least worthy of investigation and in this connection

I examined under the lens portions of young foliage from all the flowering and fruiting specimens of both species in Hb. Druce and Hb. Cardiff. The results were very promising and in every case were in accordance with Reichenbach's statement. Later I received from Cardiff material from Hb. Griffith omitted from the first consignment and this included a sheet of flowering material of undoubted *U. neglecta* from Anglesey showing more strongly fascicled bristles than any material of *U. vulgaris* previously examined. This distinction, therefore, though possibly usual, is not absolute: it cannot be accepted as a criterion and I have therefore not applied this test in an attempt to identify barren material.

There is no difficulty in identifying fresh flowering or fruiting material of these two species. The differences may be tabulated as follows:—

Corolla	*U. vulgaris* L.	*U. neglecta* Lehm.
Upper Lip.	About as long as palate.	About twice as long as palate.
Palate.	Relatively more prominent and more projecting in outline.	
Lower Lip.	Margins deflexed ± at right angles on all sides.	Spreading, more or less flat, somewhat undulate.
Pedicels.	Short (6-17 mm.) and generally comparatively stout. "Strongly recurved in fruit."	Longer (11-26 mm.) and generally comparatively slender. "Patent-erect after flowering, flexuous."
Fruits.	Very freely produced.	Very rarely produced.

The last character of *U. neglecta* appears to be true not only for Britain but throughout its European range. In the course of examining a large number of sheets of this species I have only seen one perfect capsule: in this case the pedicel, though long, was reflexed, showing that the reflexed habit in *U. vulgaris* is not specific but is merely due to the weight of the full capsule. This is the reason for the inverted commas in the above table. The supposed difference in the habit of the pedicels is not a real one but, since for practical purposes fruit is never formed in *U. neglecta*, it serves as a distinguishing character.

It is possible to identify dried flowering or fruiting material of these two species provided that the material is both well prepared and mature. But there is much material which fails to satisfy one or other or both of these requirements and for this reason and because both species are so frequently barren, particularly in northern and western localities, it is impossible to say with any degree of certainty what is the vice-comital distribution of either species in Britain. Owing to the late recognition of *U. neglecta* all the early records of *U. vulgaris* in *Comital Flora* are unreliable, as are all the numerous records based only on barren material.

In many instances there is known to be duplication, both species being recorded where only one has occurred. Such for example has been the case with S. Devon (3), Isle of Wight (10), Herefordshire (36), and Glamorganshire (41). The early records were for *U. vulgaris*, later

U. neglecta was found and recorded, and both species are still recorded in the handbooks. In the case of these counties material has been examined from all the recorded localities and has all proved to be *U. neglecta.* No doubt the same thing has happened in many other instances.

If, on the theory that the greater embraces the lesser, one assumes that the distribution given for *U. vulgaris* in *Comital Flora*, with proper emendation, represents the total distribution of the two species, then one finds that one or other [in several cases both] species occurs in 99 of the 112 vice-counties. The thirteen exceptions from which neither species is as yet recorded are v.-cc. 34, 42, 45, 50, 77?, 78, 84, 86, 87, 101, 103, 107, 108. I have seen no record for 71 (Isle of Man) but this is included in the figure 99 above, since there is barren material of one species from this v.-c. in Hb. Leeds Univ., and also of *U. minor* previously unrecorded for 71. Praeger (1934: 521) records *U. vulgaris* from all 40 Irish v.-cc. and *U. neglecta* from 11, but not having seen the material in the Dublin and Belfast herbaria I am not yet in a position to criticise these figures.

All that one can do at present with regard to the distribution of these two species is to indicate those v.-cc. from which indisputable material of each species has been seen, with the following result:—

U. vulgaris L.: **36. H. 3.**
1, 5, 6, 9, 13-15, 17, 22, 23, 25-29, 31-33, 37, 40, 53, 54, 57-59, 61, 62, 64-67, 70, 82, 83, 90, 99. H. 21, 23, 26.

U. neglecta Lehm.: **27. H. 1.**
1-4, 6, 9-13, 15, 17-19, 21, 22, 24, 27, 28, 35, 36, 41, 44, 52, 58, 63, 69. H. 2.

The records for 4 and 35 appear to be new vice-county records for *U. neglecta*, and are based on the following material:—

*4, N. Devon; Braunton Marsh, 1893 and 1911, W. P. Hiern in Hb. Hiern (as *U. vulgaris*).

*35, Monmouth; between Lower End, Magor and Llandavenny, 1904, W. A. Shoolbred in Hb. Kew and J. S. Clarke in Hb. Cardiff (both as *U. vulgaris*).

As there appear to be no other known localities in these vice-counties, 4 and 35 should be deleted from the distribution of *U. vulgaris.*

Further, Dorset (9) should be added to *Comital Flora* since there are several well-known localities. In view of Linton (1894) it is curious that the occurrence of *U. neglecta* in Dorset should have been overlooked in both Supplements to *Topographical Botany* and by Druce (1932).

No doubt there are many reliable records not included in the above figures, which are based only on herbarium material examined by myself and have no claim to be complete. When further material has been examined and as complete a search made as possible, I propose in a later communication to bring the distribution figures up to date with an enumeration of the herbarium material on which they are based.

If anything can be read into the distributions given above, they tend to show that *U. vulgaris* is more northern and eastern and *U. neglecta* rather more southern and western in general distribution. This is in accordance with the opinions of Continental authorities, e.g. Hegi (1918), who says of *U. vulgaris* (p. 166)—"practically all Europe, temperate N. Asia, N. America (Connecticut)," and of *U. neglecta* (p. 167)—"Europe (especially in South and West: apparently entirely absent from Russia), N. Africa." It should be noted that in Britain *U. vulgaris* flowers and fruits as far north as East Lothian (material from Gullane in many herbaria), Angus and Dumbartonshire, while I have not as yet seen flowering material of *U. neglecta* from further north than Westmorland. A large proportion of the recorded localities of *U. vulgaris* is in fen districts, especially in East Anglia

U. INTERMEDIA HAYNE AND U. OCHROLEUCA HARTM.

I now come to what is perhaps the most important question to be discussed in this paper. It is generally accepted by modern authorities that we have in Britain two closely allied species—*U. intermedia* Hayne and *U. ochroleuca* Hartm. This belief follows the views of Glück expressed by Druce (1911) and by Glück himself (1913). The main differences, as set out, are:—

	U. intermedia.	*U. ochroleuca.*
Terminal lobes of leaflets.	Obtuse with apical spine.	Much more acuminate.
Marginal spines.	2-10, sessile, single.	1-6, on teeth, in pairs.
Green leaves.	Without bladders.	Always bearing sporadic bladders.
Lower petal.	Longer in proportion to palate.	7-9 mm. broad × 12-13 mm. long.
Spur ("best distinguishing mark").	Equal to or shorter than lower lip, appressed, yellow like the corolla.	Half the length of lower lip, vertical to it, red-brown.

The plates and figures illustrating Glück's paper are excellent but I consider that his conclusions are faulty and not in accordance with the original descriptions of Hayne and Hartman.

U. intermedia was described by Hayne (1800) in a full diagnosis, of which the following salient points should be noted:—

"Ampullae . . . . radiculis vel cauli defoliato, numquam vero foliis, affixae.

Folia tripartita: *laciniae* . . . . margine undique setis solitariis minutissimis obsitae.

Pedunculus scapiformis, erectus, teres, bi- vel triflorus, et supra medium squama cordato-subrotunda praeditus.

Corolla . . . . sulphurea: *labium superius* subrotundum, planiusculum, deflexum; *palatum* subrotundum, striis purpureis notatum.

> [Note.—Later in his account of *U. intermedia* Hayne refers to 'blutrothen Streifen' showing that to him 'purpureus' meant blood-red. The translation of this epithet as 'purple' by many authors has given a false idea of the colour of these striae.]

Calcar e corollae basi productum, conicum, labio inferiori adpressum."

Plate V shows the habit very well. The plant illustrated has two flowers, the upper of which is laciniated in a curious manner but the lower flower is well shown with flat undulate lower lip and narrow subulate spur parallel to and nearly as long as the lower lip. The plate is coloured and shows clearly that by "sulphureus" Hayne meant a bright tone of yellow, not what we understand by "sulphur-yellow." The illustration is in full accord with my view of *U. intermedia*.

U. ochroleuca was described by R. Hartman (1857) as a new species to be distinguished from *U. intermedia* Hayne. The following characters are extracted from the diagnosis of his new species:—

"Herba tota gracilis ac tenera:
gemmae [i.e. turions] globosae et magnitudine illarum *U. minoris*:
folia . . . . laciniis acutis:
vesiculae partim inter lacinias foliorum sparsae, partim ad ramos nudos affixae:
scapus . . . . una cum bracteis, pedunculis calycibusque rufo-fuscentis coloris:
corolla pallida flava vel ochroleuca, labio inferiore rotundato, lateribus deflexo, calcare descendente, conico, obtuso, rufescente."

These characters are again emphasized by Hartman in comparing his *ochroleuca* with *intermedia* Hayne, of which he gives an equally detailed description. It is to be noted particularly that he says of *U. intermedia* that the bracts and calyces are always bright green and the spur (subulate, appressed to the lower lip) is of the same colour as the corolla and very often as long as the lower lip. There can be no doubt in my opinion that Hartman correctly understood *U. intermedia* Hayne and that his *ochroleuca* differed from Hayne's species in many well-marked characters.

Now Glück in his interpretation of *U. ochroleuca* has appreciated some of the differences from *U. intermedia* but other points of great importance he seems to have overlooked. He does not appear to have realized that all the differences stressed by Hartman—the general slenderness, the size of the winter-buds, the distribution of bladders, the brownish scape and bracts, the pale flower with short spur—are differences in the direction of *U. minor*, and Hartman's diagnosis clearly indicates a plant standing in an intermediate position between *U. intermedia* and *U. minor*. Hartman's words in connection with the bladders should be particularly noted: he uses the word "partim"—"*partly* [not sometimes or occasionally but *partly*] scattered among the green leaves and *partly* fixed to the leafless branches": in other words the distribution of bladders is the same as in *U. minor*. Some weight must also be attached to Hartman's description of the colour, because in his introductory remarks he specifically says that this character attracted his attention and he gave the name *ochroleuca* in reference to the very pale colour of the flower.

Neuman (1903) went so far as to equate *U. ochroleuca* Hartm. with *U. intermedia* Hayne × *minor* L. I cannot claim sufficient familiarity with Scandinavian material to say that this is correct but one may go as far as to say that Hartman's very detailed and clear diagnosis certainly does not entirely rule out such a possibility.

Before considering the correct identity of the British plants it is necessary to notice some other papers by Continental authorities bearing upon this matter.

Koch (1847) described what he considered to be a new species closely allied to *U. intermedia* Hayne as *U. Grafiana*. Koch attributes to this "species" obtuse apices of the terminal leaflets with more numerous marginal bristles than in *U. intermedia*, of which he gives an emended diagnosis, attributing to it acuminate leaflets with less numerous but longer bristle-bearing marginal teeth. He states that in both the colour of the flower is the same, being similar to that of *Lotus corniculatus*—"hellgelb."

Nearly 40 years later Čelakovsky (1886) described *U. brevicornis* "n. sp. (*U. intermedia* Koch in *Flora*, 1847)." This species he distinguished from *U. intermedia* Hayne by its smaller size, acuminate leaflets, occasional bladders among the green leaves, more numerous bracts on the shorter scape, emarginate concolorous upper lip, citron-yellow like the whole corolla, palate with brownish stripes and shorter spur of quite different shape. Two of these characters call for comment:—i. the more numerous bracts; according to Čelakovsky *U. intermedia* has generally only one sterile bract, which is a modification of Hayne's diagnosis in which he used the word in the singular unqualified by "generally," but in my opinion the modification is on the right lines but understated, two bracts being of frequent occurrence: ii. the concolorous upper lip, by which presumably is meant that the upper lip was not striped with brown like the palate; as will be seen presently this point is probably significant. Čelakovsky states that *U. minor* was growing with *U. brevicornis* but apparently *U. intermedia* was not present. He took the view that Koch's *Grafiana* represents the true *intermedia* of Hayne and is therefore redundant, while by "*U. intermedia*" Koch referred to the plant now named by Čelakovsky *U. brevicornis*. The argument is long, over-elaborated and unsound in my opinion, the true fact probably being that Koch described two variant forms of *U. intermedia*—corresponding to the *U. intermedia* and "*U. ochroleuca*" of those who follow Glück—and did not know the plant which Čelakovsky named *brevicornis*.

Čelakovsky evidently came to this conclusion himself later and practically admitted it in a second paper written in the following year (1887), expressing the opinion that his *brevicornis* was synonymous with *U.*

ochroleuca Hartm., which he had previously overlooked. Having called attention to but dismissed as of no consequence certain differences between Hartman's description of *ochroleuca* and his own *brevicornis*, such as the colour of the flowers, the colour of the spur which is concolorous (i.e. citron-yellow) in *brevicornis*, not red brown, and the concolorous (i.e. unstriped) upper lip in *brevicornis*, he then advances the claims of an earlier name, *U. macroptera* Brückner (1853), to replace the later *U. ochroleuca* Hartm. (1857).

This is an extremely critical question, Čelakovsky having failed after considerable efforts to trace authentic specimens of Brückner's. I think that the facts are probably as follows, that *U. brevicornis* Čelak. is a good species distinct both from *U. intermedia* Hayne, which is unequivocal, and from *U. ochroleuca* Hartm., which may be a species but is most probably a hybrid. *U. macroptera* Brückner may possibly be an earlier name for *U. brevicornis* Čelak.

Having considered shortly the names given by Continental authors to the various forms in this group, it remains to see how they fit the British plants. The first question to be answered is—Do the British plants in this group belong to one or two species? It will be recalled that among the differences between *U. intermedia* on the one hand and *U. ochroleuca* (and *U. brevicornis*) on the other are important characters of the floral parts. The shy flowering of the Utricularias already noted is especially marked in this group: although these plants occur in numerous localities in Britain, the localities in which flowers have been observed are extremely few for reasons of which we are at present ignorant. Their geographical distribution in Britain is remarkable and unusual, covering the New Forest and Wareham districts of Hants and Dorset, Norfolk, Yorkshire (Strensall Common, York only), the Lake District, and the majority of the Scottish and Irish vice-counties. In S. Hampshire (11) flowers have never been observed but in Dorset (9) the plant which has been known as *U. ochroleuca* Hartm. flowers regularly in some of its habitats.

The following description of the flowering parts in based on a detailed examination of 30 inflorescences from Hartland Moor, Dorset:—

Scape (and calyx and pedicels) pale green, not tinged with red or brown, height to summit of inflorescence 9.0-16.0 cm. (average 12.9 cm.).
Bracts pale whitish green, hyaline, not tinged with brownish-purple.
Number of flowers in inflorescence 2-flowers 8.
3-flowers 19.
4-flowers 3.
Upper lip. Length 8-10 mm. (average 8.85 mm.).
Width 7.5-9 mm. (average 8.375 mm.).
Lower lip (including palate). Length 9-11 mm. (average 10.4 mm.).
Width 13.5-16 mm. (average 14.45 mm.).
Spur. Length 5-6.5 mm. (average 5.5 mm.).

The inside of the upper lip, top and front of the palate are marked with reddish-brown lines, 10-18 on the upper lip, 8-14 on the palate.

The lines are mostly simple, some slightly branched, occasionally broken, not netted. The lines on the palate are more marked and redder in tone than those on the upper lip. In a very few specimens the veins of the lower lip are coloured also.

The spur has reddish-brown lines down the back on the outside for half its length, they then become faint as veins. The upper half of the spur is the same colour as the flower. At about half way the spur is slightly constricted. The lower half is greenish and tapers to an acute apex. The spur is slender, 1-1.5 mm. wide, ± half the length of the lower lip and parallel to it.

The colour of the flower is Lemon Chrome by Ridgway's *Colour Standards*, that is to say a bright yellow, like *Ranunculus acris*, certainly not sulphur-yellow or ochroleucous. No capsules have been seen and the pedicels after flowering are erect-patent.

There is no room for doubt that these are the flowers of *U. intermedia* Hayne: they cannot be *U. ochroleuca* Hartm. or *U. brevicornis* Celak. They were so described by E. F. Linton, *loc. cit.*

The only other British locality from which flowers have been recorded is, as far as I am aware, Roydon Common, near Lynn, W. Norfolk (28). Here W. G. Clarke found a flower of *U. intermedia* on 18th July 1910, see Clarke & Gurney (1921). The corolla is there described as pale yellow, not so pale as *minor*, lip boldly striped with orange, palate slightly striped [" lip " therefore presumably means upper lip], spur conical ⅜ in. long appressed to palate. The flowering of three plants in the same locality on June 17th, 1921, is described by Gurney (1922). I attach little importance to the descriptions " pale yellow " and " orange ": the most accurate observers are extremely vague about colours.

Apart from these recorded occurrences the following botanists have described to me their discovery of flowers:—

Mr A. J. Wilmott, with Miss M. S. Campbell, Mr F. Druce, and Mr N. D. Simpson, have seen flowers at Kerrysdale, W. Ross (105). Three of the party describe the colour of flowers as bright yellow (" the colour of *Ranunculus acris*—A. J. W."): Mr Simpson's description, " pale yellow," illustrates the fact—and it is a fact—that the same colour appears differently to different eyes. Photographs, and specimens in Hb. Mus. Brit. and Hb. Simpson make it certain that this plant is identical with the Dorset plant.

Mr N. Y. Sandwith has seen flowers in a bog at the foot of the Sow of Atholl, Mid Perthshire (88), and describes them as similar to those seen in Dorset.

Mr C. Leighton Hare and Mr A. McClintock in 1934 saw flowers near Ballinafad, W. Galway (H. 16) and describe the colour as " bright lemon yellow."

So far as the question of flowers is concerned I am satisfied that all the above were those of one species only and that species is *U. intermedia* Hayne.

This leaves for decision the question whether there is any evidence from the foliage characters that we have more than one species. In this connection there are two characters to be considered said to be specific for "*U. ochroleuca* Hartm.," i, the occurrence of sporadic bladders among the leaves; ii, the more acuminate leaflets with marginal bristles set on teeth.

Clarke and Gurney (1921) state that in Norfolk sporadic bladders among leaves are not infrequent in undoubted *intermedia* and occur at all times of year. They state that *U. ochroleuca* was only recorded once from Norfolk, *teste* Bennett, who so identified plants from Foulden Common, collected by C. W. F. Newton in September 1914. Specimens from Foulden, 19th October 1912, however, were submitted to Glück, who named them *intermedia* with many transitional leaves with acute and serrate lobes. Thus it appears that the occurrence of "*ochroleuca*" in Norfolk is at best doubtful but there is no doubt as to the occurrence of sporadic bladders. Clarke and Gurney sum up the position as to leaf-shape as follows:—"if *intermedia* and *ochroleuca* can be separated at all in Norfolk (which is doubtful), the only practicable distinction is that in *U. intermedia* SOME leaves are blunt at the ends and lateral processes are USUALLY absent, whereas in *U. ochroleuca* the leaves are ALL pointed and with lateral processes."

In my experience specimens agreeing absolutely with Glück's criteria as to foliage for *U. intermedia* are rare. Such plants occur in the New Forest, as for instance at Denny Bog, where flowers have never been observed. This plant agrees with the extreme broad-lobed *U. Grafiana* Koch but in this locality the plant is semi-terrestrial and it is probable that we have here a parallel to the terrestrial f. *platyloba* Meister of *U. minor*. I have never seen bladders among the leaves in this locality. At Hartland Moor, Dorset, the locality from which I have described the flowers, the leaf-segments are acute as described for "*ochroleuca*," but I have seen no sporadic bladders and flowers are frequent. Near Scotland Farm the plant grows, not in stagnant shallow pools as at Hartland, but in deeper water in a flowing runnel. Here occasional sporadic bladders occur but flowers are scarce. On Morden Heath, in a deep ditch the leaf-segments were longer, bladders more frequent and flowers absent. In Lake District specimens in both semi-terrestrial specimens and deep-water specimens bladders are frequent, the form of leaf-segment being that of "*ochroleuca*" in each case, longer and more slender in the deep water. In the case of flower-production there are probably climatic and chemical factors which at present are not understood. In the case of inter-foliar bladders I suggest that the semi-terrestrial forms having a horizontal habit may be able to assimilate more nourishment through their green leaves than those plants which grow in deep water with a vertical habit giving a proportionately lesser area of leaf and consequently having a greater need for bladders with which to obtain nutriment.

An examination of numbers of specimens shows a large proportion with foliage of mixed character: this is especially true of material gathered early or late in the season, when the plant is developing from or forming winter-buds. Glück clearly admits the frequent occurrence of foliage of an intermediate character while Čelakovsky (1887) modifies very considerably the views expressed in his first paper. After examining Danish and Palatinate material he came to the conclusion that " one must distinguish between two varieties of *U. intermedia*: the one, certainly more generally distributed, with broader and more obtuse leaf-segments, with more numerous and closer bristles generally placed on indistinct teeth may be called var. *Grafiana* (*U. Grafiana* Koch); the other, apparently less frequent . . . . could be designated var. *Kochiana*." The latter is the form which has been confused with *U. ochroleuca* Hartm.

I am therefore of opinion that the leaf-characters attributed to the false " *ochroleuca* " are not specific and further I do not consider that the extreme forms are deserving of varietal rank, since they are but extremes of a continuous sequence and their characteristics are induced by edaphic factors. We have already seen that in floral characters the British plants are conspecific and I therefore propose that for the British plants the name *U. intermedia* Hayne should alone be used. I would not deny categorically the occurrence of *U. ochroleuca* Hartm. in Britain. If this plant is indeed a hybrid, it might occur in this country but I can only say that I have seen no material agreeing with Hartman's description.

The distribution of U. intermedia in Britain.

Druce (1932: 228) under *U. intermedia* and *U. ochroleuca* combined gives records from 32 vice-counties but records from 4 other vice-counties (85, 93, 95, 111) published in *1st Supplement to Topographical Botany* (1905) were overlooked. Records from three more vice-counties are referred to on p. 109 above. Of the total of 39 English and Scottish vice-counties I have so far seen herbarium material from all except nine (26, 59, 67, 85, 91, 93, 95, 103, 111). The species should be found in 94, 109, and perhaps other Scottish vice-counties. Praeger (1934: 521) records 23 Irish vice-counties. The distribution as at present recorded is therefore :—

39. H. 23.

9, 11, 26-28, 59, 60, 62, 67, 69, 70, 72-74, 85, 87-93, 95-108, 110-112.
H. 1-3, 7, 9, 10, 15-20, 23, 25-28, 30, 33-35, 39, 40.

It is possible that H. 21 should be added on the evidence of a scrap of material in Hb. Smith wrapped in a piece of paper marked in pencil, " Specimen wild from near Dublin, D. Turner," and " near Dublin, Dr Scott." A locality in Co. Wicklow might however be described as " near Dublin."

The distribution of U. intermedia abroad.

According to Hegi (1918) the general distribution of *U. intermedia* is " almost all Europe, Siberia, N. America (Connecticut)," while the distribution of "*U. ochroleuca* Hartm." he gives as "Great Britain, Ireland, Hebrides, France, Holland, Germany, Bohemia, West Galicia, Denmark, Norway, West Greenland," with the main centre of its distribution in the Scottish Highlands. It is quite certain that Hegi has followed Glück's misinterpretation of *U. ochroleuca* Hartm., with which he considers *U. brevicornis* Čelak. to be synonymous. Recent material from the Black Forest show that present day German botanists still have the same misunderstanding. In fact all modern Continental botanists appear to follow Glück in this matter but Höppner (1913) in his account of *U. ochroleuca* Hartm. combines the views of Glück with a description of the plant from Köningsveen familiar to himself and known to German and Dutch botanists as *U. ochroleuca*.

From the accounts of Continental authorities it is clear that *U. intermedia* and "*U. ochroleuca*" are just as rarely found in flower abroad as in this country. Two localities however are mentioned in which "*U. ochroleuca*" is said to produce flowers freely, Köningsveen, near Nijmwegen, on the Lower Rhine and the Lac du Longemer in the Vosges. It was obviously very desirable to compare material from these localities with Dorset material and through the good offices of Mr P. Vermeulen and Mr Joh. Jansen I was able to obtain both dried and fresh material from the Köningsveen. This proved to be distinct from anything seen from Britain and the following data from fresh material should be compared with the data given for Dorset *U. intermedia* ("*ochroleuca*") given earlier in this paper.

Foliage very slender with numerous bladders: the bladders on specialized branches relatively much smaller than in *intermedia*.
Scape, calyx and pedicels. Reddish-brown, scape 8-9.5 cm., slender.
Pedicels. Much shorter than in *intermedia*.
Bracts. Brownish-purple (as in *U. minor*), 2 or 3 on a scape.
Upper lip. Length 5 mm. × breadth 3.5 mm.
Lower lip. Length 8.5 mm. × breadth 8 mm.
Palate. Relatively larger and more prominent.
Spur. 3.5 mm., conical, divergent from lower lip, ± concolorous with corolla, apex greenish.
Colour of corolla. Between Empire yellow and Wax yellow of Ridgway, i.e. a rather duller tone than *intermedia* but a much fuller yellow than sulphur-yellow or ochroleucous.

The palate and throat of the flower, but not the upper lip, are heavily marked with a network of brown, not red, lines.

It will be clear from the above data that this plant agrees in every respect with the description of *U. brevicornis* Čelak. It does not agree so well with the description of *U. ochroleuca* Hartm. and whatever may be the case with the latter, I consider that the plant under consideration is a good species. It grows with *U. minor* but the nearest locality for *U. intermedia* is some few miles away. The shape of the flower, more especially the prominent palate, together with the distinctive marking of the throat and palate and the unstriped upper lip, are very different from what would be expected if the plant were the hybrid *U. intermedia* × *minor*.

Since the Dutch "*ochroleuca*" proved to be so very distinct from our Dorset "*ochroleuca*" I sent some well-prepared material of the latter to Holland, where it reached the Dutch authority on this genus, Kloos. The result was interesting, since he determined a sheet from Hartland Moor as *U. intermedia* (correctly, as I think) and a sheet from the neighbouring locality near Scotland Farm as *U. ochroleuca* Hartm. f. *stagnalis* Höppner, which is the name the Dutch botanists give to the Köningsveen plant. My two gatherings were most certainly conspecific and equally certainly not identical with the Dutch plant. Perhaps he did not realize that they were from neighbouring localities, and was misled by seeing the word "Scotland" on one of the labels!

It is to be noted that in *U. brevicornis* the length of the upper lip is about 1½ times the breadth, whereas in *U. intermedia* the length and breadth are approximately equal. The ratio between the lengths of the upper and lower lips is about the same in each case but the narrower upper lip in *U. brevicornis* appears to produce the illusion, especially in dried material, that the upper lip is relatively longer than in *U. intermedia*. This may have some bearing upon *U. macroptera* Brückner in view of Čelakovsky's suggestion that this epithet was given in reference to the character given by Brückner in his diagnosis—"upper lip of the corolla twice or thrice exceeding the palate."

The plant of Lac du Longemer also appears to be *U. brevicornis* Čelak. (? = *U. macroptera* Brückn.). There is a sheet from this locality in Hb. Kew, No. 297, in F. Schultes' herb. norm., nov. ser., cent. 3, named *U. intermedia* Hayne. It appears to be identical with the Köningsveen plant: it is certainly not *U. intermedia* Hayne.

On the other hand the French gatherings from near Nantes, Lloyd, 1845, and F. G. Schultz, 501, near Deux-Ponts, are correctly named *U. intermedia*, of which I have also seen material from Switzerland, Holland, Germany, Norway, Sweden, Russia and Manchuria.

U. MINOR L. AND U. BREMII Heer.

The remaining problem is whether we have in Britain in addition to *U. minor* L. a closely related species *U. Bremii* Heer. This is a Central European species, admitted by all authorities to be extremely critical and separable from *U. minor* solely by its larger size, and larger and darker flowers with expanded subrotund lower lip.

This species was first claimed as British by F. M. Webb in *Journ. Bot.*, 1876, p. 142 et seq., on the strength of specimens collected in 1833 by the Rev. J. B. Brechan in the Moss of Inshoch, Nairnshire. The identification was accepted by F. N. Williams (1909), who also placed here gatherings from Isle of Wight (10), Titchfield Common (11) and Loch Spynie (95). He treated it as a var. of *U. minor*, following Druce (1908). Williams' description contains the inexplicable words "palato sanguineo," a character to which I find no reference in any other authority. Bennett (1910) referred to *U. Bremii* the above-mentioned gatherings and others, e.g. those from Broadford, Skye (*McVicar*, 1895) and Colonsay (*McNeill*, 1908).

Most of the foregoing gatherings can be safely attributed to coarse examples of *U. minor*. One might say " all " were it not for unusual features presented by two sheets of material from Loch Spynie in Hb. Brit. Linn. Soc. Lond., which should be compared with a sheet of Brechan's original gathering in Hb. Kew. All three sheets are labelled *U. intermedia*. They are certainly not that species but resemble very stout examples of *U. minor* with expanded labella and thick conical spurs, short but longer than in normal *U. minor*. With regard to the floral characters given for *U. Bremii* it is to be noted that when the flowers of *U. minor* first unfold from the bud they are pale yellow, not whitish-yellow, in colour and the corolla is flat, the margins deflexing subsequently.

Glück maintained that in barren material it was impossible to separate *U. Bremii* from *U. minor* and after examining considerable British material pronounced as authentic *Bremii* one sheet only, a gathering by G. C. Druce from the Gap of Dunloe, near Killarney. The material on this sheet is worse than scrappy, it is fragmentary, but I can see in the flowers on the broken scapes nothing whatever which encourages me to see here anything but quite normal *U. minor*.

It is conceivable that in the Moss of Inshoch and at Loch Spynie we have a plant distinct from *U. minor* and indeed from all British species but the available material is meagre and very old. New material from these localities would be most valuable. In the meantime it should be assumed that *U. Bremii* Heer, like *U. ochroleuca* Hartm., is not entitled to a place in the British list.

THE DISTRIBUTION OF U. MINOR IN BRITAIN.

U. minor L. is the most familiar British species. Druce (1932: 228) records it from 83 vice-counties and Guernsey. To these figures are to be added two further vice-counties (43 and 105) recorded in the *First Supplement to Topographical Botany* (1905), while as stated above there are specimens from the Isle of Man (71) in Hb. Leeds Univ. Praeger, *loc. cit.*, and Druce, *loc. cit.*, both record the species from all the Irish vice-counties except Dublin. The known distribution is therefore:—

86. H. 39. Guernsey.
1, 2, 6, 9-15, 17, 21-32, 37-54, 58, 59, 61-65, 67-77, 81, 83, 85-105, 108, 110-112. H. 1-20, 22-40.

There are some curious gaps in this distribution, some of which particularly in Scotland will no doubt be filled in the course of time. One can understand the absence of this species from E. Gloster and both divisions of Wiltshire (though it might occur in the extreme S.E. of the county) but it is surprising that it should be absent entirely from Devon and S. Somerset. This species flowers and fruits freely in many localities: I have seen flowering material from as far north as N. Aberdeen and Argyll.

General distribution. South and Central Europe northwards to Iceland and Scandinavia (to lat. 70° 29' N., near Hammerfest) (Hegi).

In conclusion I wish to emphasize the problem which is the real cause of difficulty in this genus—why do they flower so shyly? If the reason for this could be discovered, it might then be possible by artificial cultivation to solve some of the other problems. I commend this to the attention of a research worker.

ACKNOWLEDGMENTS.

I am glad to have this opportunity of expressing my indebtedness to a large number of helpers for their kindness and goodwill: to the owners and curators of the numerous herbaria consulted, especially Mr A. J. Wilmott of the British Museum, who besides giving much general help has in conjunction with Mr J. E. Dandy guided me (I hope) across the slippery slope of nomenclature: to many kind friends in the Kew Herbarium, who answer tiresome questions patiently and apparently with pleasure: to the officials of the Linnean Society for much courteous attention: to Professor Matthews and Mr C. Leighton Hare of Aberdeen University, Mr A. E. Wade of Cardiff, Dr W. A. Sledge of Leeds, Mr John Chapple of Oxford: to Mr R. H. Corstorphine, to whom members of the B.E.C. are so much more indebted than they realize: to Miss E. Vachell for photographs of *U. neglecta*. Finally, it gives me particular pleasure to acknowledge the help received from our Corresponding Members, Monsieur Pierre Senay, who has taken much interest in the subject, and Messrs P. Vermeulen and Joh. Jansen, who went to great trouble to supply me with Dutch material.

HERBARIA CONSULTED.

Hb. Aberdeen Univ. = The herbarium of the Dept. of Botany, University of Aberdeen.

Hb. Birmingham City = The herbarium of the Museums Dept., City of Birmingham.

Hb. Birmingham Univ. = The herbarium of the University of Birmingham.

Hb. Brit. Linn. Soc. Lond. = The Linnean Society of London's herbarium of British plants.

Hb. Cardiff = The herbarium of the National Museum of Wales, Cardiff.

Hb. Druce = The herbarium of the late G. C. Druce [with additions subsequent to his death by Mr J. F. G. Chapple] kept as a separate collection in the herbarium of Oxford University.

Hb. Exeter = The herbarium of the Exeter Museum.

Hb. Griffith = The herbarium of the late J. E. Griffith kept as a separate collection in the herbarium of the National Museum of Wales, Cardiff.

Hb. Hall = The private collection of the author.

Hb. Hiern = The herbarium of the late W. P. Hiern, the property of the Devonshire Association and kept as a separate collection in the Exeter Museum.

Hb. Kew = The herbarium of the Royal Botanic Gardens, Kew.

Hb. Leeds Univ. = The herbarium of the Dept. of Botany, Leeds University.

Hb. Linn. = The herbarium of Carl von Linné, the property of and kept as a separate collection by the Linnean Society of London.

Hb. Malvern = The herbarium of the Malvern Free Library.

Hb. Mus. Brit. = The British collection of the British Museum (Natural History), S. Kensington.

Hb. Simpson = The private collection of Mr N. D. Simpson, of Bournemouth.

Hb. Sledge = The private collection of Dr W. A. Sledge, of Leeds.

Hb. Smith = The herbarium of the late Sir J. E. Smith, kept as a separate collection by the Linnean Society of London.

Hb. Todd = The private collection of Miss E. S. Todd of Aldbourne, Wilts.

Hb. Torquay = The herbarium of the Torquay Natural History Society.

Hb. Watson = The herbarium of the late H. C. Watson kept as a separate collection in Hb. Kew.

Hb. Vachell = The private collection of Miss E. Vachell, of Cardiff.

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NOTES ON BRITISH RUMICES: I.

J. Edward Lousley.

Preliminary work on the preparation of a new account of British *Rumices* for the projected New Students' British Flora has brought to light a considerable amount of fresh information, and has at the same time revealed that a surprising proportion of published material is in need of revision. It is clear that within the few pages which can reasonably be allotted to the genus *Rumex* in a portable Flora it will be impossible to give full accounts of units below the rank of species, of hybrids, or of aliens. In addition the opportunity is being taken of making a complete revision of the vice-county records, and considerable work is being done on such questions as duration, time of germination, and ecology with a view to making the statements on these matters more accurate than would be possible using only previously published observations.

The present series of notes has therefore been commenced with a view to amplifying the condensed summary to be given in the Flora, and particularly with the following objects:—

(1) To publish conclusions arrived at by the writer, with a view to stimulating constructive criticism from as many botanists as possible. The material throughout these notes is intended to be corrected and amplified as additional information comes to hand.
(2) To indicate the questions on which further information is most urgently desired, and to stimulate interest in the group.
(3) To publish names new to the British list with adequate supporting references, and to give details when questions of nomenclature have been investigated.
(4) To give a revised distribution by vice-counties for all less widely distributed species, supported by cited herbarium material.

With such objects in view the treatment of the various species will not be uniform, and for practical reasons it is not advisable to deal with all the species and hybrids *seriatim*. In order to retain the same sequence in the instalments of these notes the numbers given in Druce's *British Plant List*, *Ed. II*, will be prefixed to the species, although complete rearrangement of the sequence in that List will ultimately be necessary.

COLLECTION OF MATERIAL.

For critical determination of *Rumices* the following are essential:—

(1) A panicle bearing fully matured fruits (see also below under "Description of Organs").
(2) Part of the main stem bearing the lowest leaves obtainable.

The material should be dried in some form of plant-press calculated to give even pressure over the whole specimen. Many specimens have been spoiled in the past by subjection to heavy pressure between hard unyielding surfaces, which results in the thicker parts of the plant becoming broken and squashed while at the same time the more delicate portions wrinkle and lose their shape. The writer has found that the corrugated cardboard " dryers " supplied by Messrs. Flatters & Garnett, Ltd., placed between each specimen hasten drying with a minimum of distortion, and also obviate any marks across the leaves such as sometimes result from pressure transmitted from neighbouring stems.

It will frequently be advisable in the course of these notes to warn readers against immature material, and the extent to which this warning is necessary will readily be appreciated after inspection of almost any large herbarium. *Rumices* can usually be approximately identified from the seedling stage onwards, but since the characters of the fruit which are universally used for critical determination are absent until the seed is fully ripe, it is almost always advisable to leave immature material ungathered.

A warning is also necessary against the practice of gathering leaves from plants adjacent to the one from which fruit is collected. At the time of fruiting the lower leaves of almost all Docks have decayed away, and it is then a great temptation to gather fresh leaves from adjacent younger or barren plants. This practice is liable to lead to mixed gatherings and consequent confusion, and is only permissible when the collector has studied a colony over a lengthy period and is quite certain that it is homogeneous. Even in such cases it is preferable to take material from a single marked individual in different stages of growth. Generally it is better to be content with the lowest stem leaves obtainable, even if these are not in perfect condition, rather than to run the slightest risk of a mixed gathering.

DESCRIPTION OF ORGANS.

(1) *Leaves.* Most Docks produce a rosette of leaves, which remain in good condition only so long as the individual is barren. The term *radical leaf* is applied only to the leaves of this rosette. When the flowering stem appears, it bears *cauline* (stem) leaves, which in change of shape form a continuous series from the radical leaves to those immediately below the panicle and even to the bracts within the panicle. When a separate description of stem leaves is given it refers to those about one-half to two-thirds of the way up the stem. In order to obtain descriptions of the radical leaves it has been necessary to mark down plants for observation throughout the year (see below under *Exsiccata*). Naturally it is not expected that users of the descriptions will do the same with every plant they name, but the lower down the stem that cauline leaves are collected the nearer they will approximate to the descriptions of the radical leaves, which are generally subject to least variation within the taxonomic units.

(2) *Flowers and Fruit.* The perianth of a *Rumex* is composed of six segments, three of which are arranged in an inner whorl, and three in an outer. The three inner were termed " petals " and the three outer " sepals " by Babington, while Hooker in his *Student's Flora* refers to all six as " sepals." It is proposed to refer to them as *Inner* and *Outer Perianth Segments*, or *Tepals.*

At the time of flowering there is usually extremely little difference between the two whorls, but after fertilisation the inner tepals rapidly enlarge until they greatly exceed the outer tepals which remain little changed. As the fruit matures, the inner tepals take on the characters which are of such great importance in the differentiation of species and segregates. Thus, for example, they may eventually become dentate, reticulate, or tubercled. When this process has reached its maximum development, it is proposed to call them *valves.* It is important to note that the development of the tepals cannot be presumed complete on the sole evidence that fruit is formed within, for it continues until the fruit is fully mature and ready for dispersal. In the state to which the term is to be restricted the valves are dry structures, often brown and hard. The addition of the word " mature " has been occasionally added when describing the valves, as, although in the strict sense of this definition redundant, it is employed to indicate cases where it is of especial importance that the valves should be absolutely mature. The development of the inner tepals into valves is calculated to protect the fruit within, and the variations used as characters in taxonomic botany aid in the dispersal of the fruit by various agencies.

The term " valve " has the advantages of precision and brevity, and is also easily rendered in Latin. The following are examples of the terms used in some of the more recent British works to describe the same organs :—

1. (Inner) Fruiting Sepals—Hooker's *Student's Flora.*
2. Sepals—Hayward's *Botanist's Pocket Book.*
3. Enlarged Petals—Babington's *Manual.*
4. Inner Segments of the Fruiting Perianth—Bentham & Hooker's *Handbook.*
5. Fruiting Segments—Moss, *Cambridge British Flora.*
6. Enlarged Petals in Fruit, also Fruit-Petals—Syme, *English Botany.*
7. Ripe inner Perianth Leaves—Trimen, e.g. in *Journ. Bot.*, *11*, 129, 1873.
8. Lockets—Purchas & Ley, *Fl. Herefordshire*, 251, 1889.

Tubercles are spherical or ovoid structures, which develop in many species of *Rumex* on the mid-nerve of the valves as they approach maturity. They are filled with large corky cells with big air-spaces and their function is to act as floats to water-borne fruits. The tubercle has been variously styled a " grain," " bead," or " callus " by various authors.

The fruit (*sensu stricto*), which develops within, I refer to as the *nut*, as it is a one-seeded fruit, with a woody pericarp, developed from a syncarpous ovary. The term, however, is usually applied to the product of an inferior ovary, whereas the ovary in *Rumex* is superior. Some authors have used the term "achene" for the fruit of the Docks but this is even less satisfactory, since an achene is strictly the product of an apocarpous ovary. Rechinger (1937) has described them as "nutlets" but this would appear to have little or no advantage over the word "nuts," and it has the disadvantage of being four letters longer.

It is proposed to reserve the term *fruit* for use in the wider sense—i.e. for the nut together with the enveloping valves, the receptacle and the pedicel down to the point where it breaks away from the parent plant.

RUMICES BRITANNICAE EXSICCATAE.

Owing to the inadequate representation of this genus in many public herbaria it was decided to distribute as widely as possible a series of dried material of British species, hybrids, and varieties with labels numbered under the above heading. Every care has been taken to avoid any possible mixture, and, where practical, material was gathered in various stages from pure colonies which were kept under monthly observation. Exactly 200 numbers were collected during 1938, but it was only of about 50 of these that material could be obtained in sufficient quantity to supply all the intended herbaria with the same reference number. Such a situation was bound to arise in the case of many hybrids when the same reference number was only given to material from a single individual.

Sets have been supplied to the following herbaria, the sequence indicating the relative completeness of each set:—

Natürhistorisches Museum, Vienna (Dr Karl Rechinger, Jnr.).
British Museum (Natural History), South Kensington.
Royal Botanic Gardens, Kew.
National Museum of Wales, Cardiff.
South London Botanical Institute, Tulse Hill, London.
Royal Botanic Gardens, Edinburgh.

Surplus sheets have also been distributed elsewhere.

This series is cited in the following notes as "Lousley (00)."

As much of the material as possible was collected from the five following localities, which were kept under approximately monthly observation throughout summer and winter. The details here given will assist future students in interpreting the dried material—especially that of the hybrids—and also the results of studies in life-history and ecology, which were carried on chiefly at these stations. The labels on the *Exsiccata* were printed throughout in order to avoid errors in citation by botanists not familiar with British topography, and it was necessary to describe the localities rather vaguely in the terms given first in the following list. All material so localized was collected within the narrow limits described below. Watsonian vice-county numbers were omitted as they are often misunderstood on the Continent, but the corresponding names (e.g. Mid-Perth) were used throughout.

A. SHALFORD COMMON, 2 miles S. of Guildford, Surrey. Only the sandy portion of the Common W. of the Guildford-Bramley road was studied, together with an adjoining water meadow.

Species present: *R. crispus* L., *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser, *R. sanguineus* L. var. *viridis* Sibth., *R. conglomeratus* Murray, *R. pulcher* L. ssp. *eu-pulcher* Rech. fil., *R. Acetosa* L., and *R. Acetosella* L.

Exsiccata: 1, 20, 21, 59, 60, 61, 62, 189.

pH of soil water: varied from 5 (sandy ground around roots of *R. Acetosella*) to 8 (around roots of *R. pulcher* at base of wall).

B. MITCHAM JUNCTION, Surrey. An old gravel working, most of which is now filled with a large permanent pond, close to Mitcham Junction (S.R.) station. Part of this area has recently been used as a rubbish dump.

Species present: *R. crispus* L., *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser, *R. obtusifolius* L. ssp. *sylvestris* (Wallr.) Rech. pat. (rare—on dump only), *R. sanguineus* L. var. *viridis* Sibth., *R. conglomeratus* Murray, *R. palustris* Smith, *R. Acetosa* L., *R. Acetosella* L.

Exsiccata: 23, 24, 25, 26, 26a, 52, 53, 54, 55, 56, 168, 169, 198.

pH of soil water: 6.5-7.5 (-8 on some chalky rubble introduced at one spot).

C. CHISWICK, Middlesex. A triangular piece of waste ground bounded by the new Mortlake-Chiswick road, the Chiswick-Barnes Bridge railway, and the River Thames. Dumping had at various times taken place over the whole of this area.

Species present: *R. crispus* L., *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser, *R. obtusifolius* L. ssp. *transiens* (Simonk.) Rech. fil., *R. sanguineus* L. var. *viridis* Sibth., *R. conglomeratus* Murray, *R. Patientia* L. ssp. *orientalis* (Bernh.) Danser.

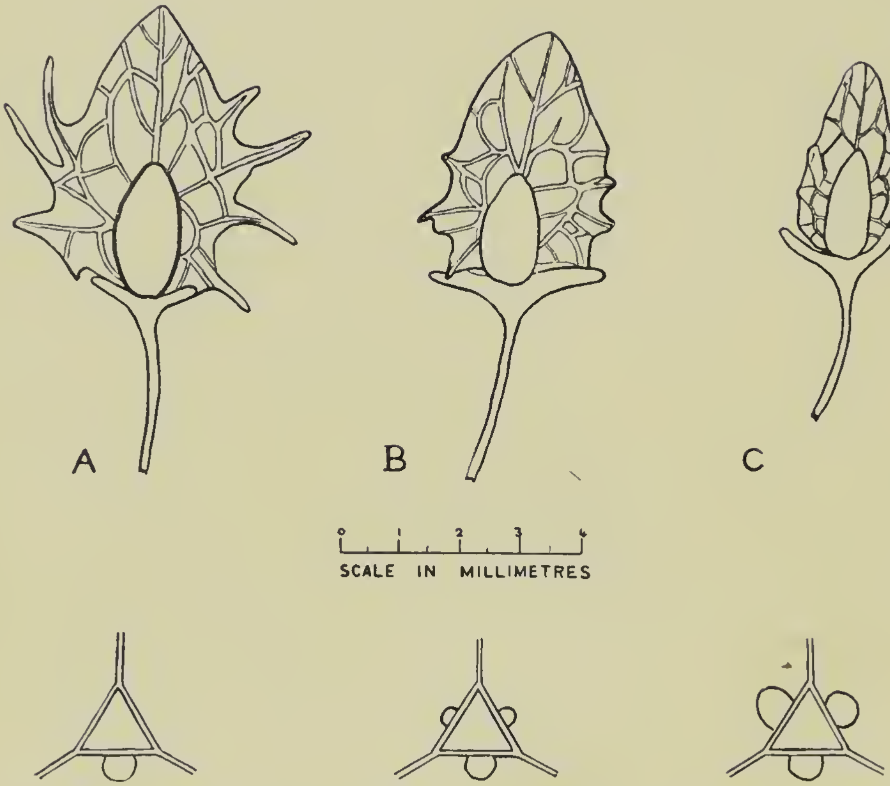
Exsiccata: 10, 11, 14, 15, 38, 39, 40, 41, 42, 44, 46, 50, 144.

pH of soil water: 7.5-8 (around roots of *R. Patientia* L.) but probably subject to local variation owing to the "made" nature of the ground).

D. ALFRISTON, E. Sussex. The Cuckmere valley as bounded to the N. and S. by the limits of the village, and E. and W. by the parallel roads. Most of this area is composed of water-meadows bounded on both sides by calcareous slopes.

Species present: *R. Hydrolapathum* Huds., *R. crispus* L., *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser, *R. sanguineus* L. var. *viridis* Sibth., *R. conglomeratus* Murray, *R. Acetosa* L., and also *R. pulcher* L. ssp. *eu-pulcher* Rech. fil. in very limited quantity.

BRIT. MUS.



RUMEX OBTUSIFOLIUS L.—FRUITS. ×10.

A. Ssp. *agrestis* (Fries) Danser, Godalming, Surrey (*Rum. Exs. Brit.*, No. 2).

B. Ssp. *transiens* (Simonkai) Rechinger fil., Chiswick, Middlesex (*Rum. Exs. Brit.*, No. 11).

C. Ssp. *sylvestris* (Wallroth) Rechinger pat., Mitcham, Surrey (*Rum. Exs. Brit.*, No. 52).

The upper row illustrates tubercled valves, the lower row diagrammatic representations of transverse sections through the fruit to show presence or absence and relative size of tubercles on the three valves.

Exsiccata: 6, 7, 33, 148, 149, 188.
pH of soil water: 7-8.

The new Cuckmere drainage scheme destroyed several plants which were under observation before fruit could be collected.

E. HENDON, Middlesex. The sheet of water known officially as the Brent Reservoir, and popularly as the "Welsh Harp," and the meadows and slopes immediately adjoining.

Species present: *R. crispus* L., *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser, *R. conglomeratus* Murray, *R. palustris* Smith (abundant), and *R. Acetosa* L.

Exsiccata: 126, 126a, 127, 128, 178, 181, 193, 194.
pH of soil water: 7-8.

SPECIES.

618/6. R. OBTUSIFOLIUS L., *Sp. Pl.*, 335, 1753.

Icones. Trimen in *Journ. Bot.*, *11*, *t.* 131. 1873. The illustrations given by Syme, Moss, and Fitch & Smith are all very unsatisfactory.

Type. Hb. Linn. No. 17 marked "H.U." (Hort. Upsala), and labelled "obtusifolius" in the handwriting of Linnaeus must be regarded as the type specimen. This is in bud only, but represents the species now known under this name. Hb. Linn. No. 18 bears a leaf and branch in good fruit, and represents an unusual form of ssp. *agrestis* Rech. fil.—perhaps from secondary growth.

Rechinger (*BBC.*, *49*, 41-65, 1932) has divided *R. obtusifolius* L. into four subspecies, of three of which he has identified British material. The great variation which occurs within the species has long been recognised and many names have been given to the variants, but Rechinger's painstaking work is the first serious attempt to study the species throughout its geographical range, and to reduce the variations and synonyms to a logical account. In the course of his work he examined many times as many specimens as are available in this country, and had the advantage of field work in many of the countries of Europe. The Docks of Central Europe and Russia are very inadequately represented in the British public collections, and very few of the *exsiccata* cited by Rechinger have been seen. He shows that each of his subspecies occupies a definite geographical area, and that where these areas overlap intermediates are most frequent. In this country only ssp. *agrestis* occurs as a native, it being practically certain that all material falling under the other subspecies is adventive. It appears that in Britain it may not be easy to draw an absolute line between ssp. *sylvestris* and ssp. *transiens*, although in well selected material they are very distinct. In view of the scanty material of these alien plants which is available, it is considered wise to follow Rechinger in retaining them both as subspecies.

The following key to the segregates of *R. obtusifolius* L. is based on the key given by Rechinger (*loc. cit.*, 44):—

- 1a. Valves with long teeth, most of which exceed the width of the valves .... ssp. *agrestis* (Fries) Danser f. *subulatus*.
- 1b. Valves entire or toothed. Teeth, when present, at most equalling the width of the valves.
  - 2a. Valves entire, or almost so. All three tubercles well developed, usually subequal, often occupying almost the whole width of the valve .... ssp. *sylvestris* (Wallr.) Rech. fil.
  - 2b. Valves toothed.
    - 3a. Only one tubercle well developed.
      - 4a. Valves ovate to broad ovate-triangular, more or less obtuse, *c.* 6 mm. long. Undersides of leaves and petioles usually hairy ssp. *agrestis* (Fries) Danser.
      - [4b. Valves narrow-triangular, acute, *c.* 5 mm. long. Plant usually glabrous .... ssp. *subalpinus* (Schur) Simonk.]
    - 3b. All three tubercles well developed.
      - 5a. Valves rather narrow, ovate-triangular. Teeth very short (*c.* 0.5 mm.) .... ssp. *transiens* (Simonk.) Rech. fil.
      - 5b. Valves broadly ovate-triangular. Teeth long (1-3 mm.) .... ssp. *agrestis* (Fries) Danser f. *trigranis*.

It must be remembered that for the certain distinction of the four subspecies absolutely ripe fruit is usually essential. Even in the common ssp. *agrestis* the tubercles and teeth on the inner perianth segments do not develop until the fruits are completely ripe. Specimens on which the perianth segments have enlarged, containing formed but immature fruit, have frequently been gathered before development is complete, and mistaken for the subspecies which have entire valves.

Subsp. AGRESTIS (Fries) Danser, *Ned. Kruid. Arch., 1925*, 424, 1926; *R. obtusifolius* L. var. *agrestis* Fries, *Novit. Fl. Suec.*, ed. 2, 99, 1828; *R. obtusifolius* L. a. *macrocarpa* Dierbach in Geiger, *Mag. Pharm., 4*, 16-21, 1826 (*teste* Rechinger): *R. Friesii* Grenier & Godron, *Fl. France, 3*, 36, 1856: *R. obtusifolius* L. a. *agrestis* (Fr.) of Babington, *Manual*, recent eds.: *R. obtusifolius* L. b. *agrestis* of Hayward's *Botanist's Pocket Book*, recent eds.

Icones. Beck in Rchb., *Icones, 24*, t. 181, figs. 1-3; Danser, *Ned. Kruid. Arch., 1921*, t. 1, figs. 2-4, 1922 (very good); Rechinger, *loc. cit.*, t. 2, fig. 16; Trimen, *Journ. Bot., 11*, t. 131, figs. 2a, 3a, 4a, 5a, 1873.

Exsicc. 17, Surrey; Godalming. Lousley (2)—*teste* Rechinger. 21, Middlesex; Camden Terrace (wild), Camden Town—probably the material from which the unsatisfactory *E.B.* 1999 was drawn, J. de C. Sowerby (Hb. Mus. Brit.)—also Lousley (20), (26a), (34), (56), (128), and (144).

Fruiting valves ovate-triangular, obtuse or rather so, *c.* 6 mm. long, one (rarely all) tubercled; margins with prominent teeth, which are usually about equal to or slightly shorter than the width of the valve, rarely longer than the valves are broad. Petioles and leaves usually pubescent-scabrid below.

Distribution. Native; on waste-ground, roadsides, and about buildings and gardens, field borders and hedgerows, favouring disturbed ground wherever the soil is not too deficient in organic matter or too dry. Occurs abundantly throughout the British Isles though less frequent towards the extreme north (probably owing to the comparative scarcity of suitable habitats). This is the common British *obtusifolius* and there is no reason to doubt that ssp. *agrestis* occurs in every vice-county from which the species has been recorded.

Distribution abroad. Western Europe from N. Spain, Britain and France to Hungary, Central Germany, S. Sweden and Norway.

Two unimportant forms occur in Britain as follows:—

Forma PURPUREUS (Poiret) mihi, comb. nov.; *R. purpureus* Poiret, *Encyc. Méth.*, *5*, 63, 1804; *R. obtusifolius* L. var. *discolor* Wallroth, *Sched. crit.*, *1*, 168, 1822; *R. obtusifolius* L. var. *purpureus* Petermann, *Fl. Lips.*, 266, 1838.

Stem and leaf veins suffused with deep red similar in colour to that of beet. (This colour is described from dried material only.)

A mere colour form which has sometimes been confused with *R. sanguineus* L. var. *purpureus* Stokes. See Danser, *Ned. Kruid. Arch.*, *1921*, 209-210, 1922. There is an unlocalised, undated specimen in Herb. Smith. Extreme examples of this plant have been cultivated in botanic gardens for their foliage.

Forma PANDURIFOLIA (Borbas) Beck in Rchb., *Icones*, *24*, 38, 1904; *R. obtusifolius* L. var. *pandurifolia* Borbas, *OBZ.*, *39*, 310, 1889.

Icones. Danser, *Ned. Kruid. Arch.*, *1921*, t. 1, figs. 5 and 6.

Lower leaves constricted above the base in the form of a fiddle.

Occasionally individual plants answering to the description of this form may be found in Britain and they have sometimes been confused with *R. pulcher*.

The following forms are of greater importance:—

Forma TRIGRANIS (Danser) Rechinger fil., *BBC.*, *49*, 46, 1932; *R. obtusifolius* L. ssp. *Friesii* (Grenier) var. *trigranis* Danser, *Ned. Kruid. Arch.*, *1921*, 209, 1922.

All three valves tubercled.

Rechinger (*loc. cit.*, 51) cites the following material for this form:—17, Surrey; Kew, Nicholson (1099). 28, W. Norfolk; Wells, Lomas. To which may be added:—85, Fife; Invertiel, Syme (Hb. Hanbury).

Danser's original description of this variety (*loc. cit.*, 209) also included a name for the typical subspecies and reads as follows:—

> "Varietates secundum perigonii grana.
> 1. *unigranis* (nova var.) anterior tantum valva grano ornata. Vulgatissima varietas.
> 2. *trigranis* (nova var.) etiam valvae laterales grano ornatae. Rarissima varietas."

Forma SUBULATUS (Rech. pat.) Rechinger fil., *BBC.*, *49*, 47, 1932; *R. obtusifolius* L. ssp. *subulatus* Rechinger pat., *OBZ.*, *43*, 51, 1892.

Valves with long (3-4 mm.) teeth which at least equal in length the width of the valves.

Rechinger pater draws attention to the resemblance of the valve teeth of this form to those of *R. maritimus* in sharpness and length. Rechinger fil. states that the form has been confused with *R. dentatus*.

Rechinger fil. (*loc. cit.*, 47) cites the following material:—20, Herts.; Ayot Green, H. Groves (Hb. Cluj), but material has been seen in British herbaria under the same label which does not answer to the description. Groves certainly gathered several forms from this station.

Subsp. TRANSIENS (Simonkai) Rechinger fil., *BBC.*, *49*, 52, 1932; *R. silvestris* Wallroth var. *transiens* Simonkai, *Math. term. Közl.*, *16*, 119, 1881; *R. silvester β* Danser, *Ned. Kruid. Arch.*, *1921*, 209, 1922; *R. obtusifolius* L. var. *sylvestris* Trimen, *Journ. Bot.*, *11*, 131, 1873, and probably of all subsequent British authors.

Icones. Rechinger, *loc. cit.*, t. 2, fig. 17; Danser, *loc. cit.*, t. 1, fig. 8 (valve too narrow); Trimen, *loc. cit.*, t. 131 (valve too narrow and acute, teeth shorter than in typical examples).

Exsicc. 17, Surrey; between Putney and Hammersmith, on the Thames' bank, 1872, Warren (Hb. Mus. Brit.). 21, Middlesex; waste ground, Chiswick, Lousley (11)—*teste* Rechinger.

Ripe fruiting-valves ovate-triangular, obtuse or rarely somewhat acute, *c.* 5 mm. long, 2-3 mm. broad, all with tubercles, one of which is usually much larger than the other two, all margins toothed near the base, teeth up to half the width of the valve in length but often much shorter (in British material the teeth on some valves in a panicle may be extremely short). Petioles and leaf-nerves sparingly pubescent-scabrid beneath.

Distribution. In Britain an established alien known only from the vice-counties given above, where it occurs on the banks of the River Thames and in adjoining waste land from Putney to above Kew Bridge. Frequently collected in this area since its discovery in 1872.

Distribution abroad. Central Europe from Southern Sweden through Germany to Austria and Hungary, introduced elsewhere.

Subsp. *transiens* is very closely allied to ssp. *sylvestris*, from which it is best distinguished (in British material) by the larger, much broader, fruits, the very unequal tubercles, and the presence of definite teeth on the basal margins of the valves. Whereas in ssp. *sylvestris* the base of the valve tends to be cuneate with the tubercle taking up almost all the width, in ssp. *transiens* the base is truncate and owing to the greater width even the largest tubercles leave about half the width exposed.

This is the plant which was described by Trimen (*loc. cit.*) as *R. obtusifolius* L. var. *sylvestris* from material collected above Putney by Warren in 1873, and the material upon which his account is based is in Hb. Mus. Brit. Trimen's statement (*loc. cit.*, 130) that the branches of this plant make a more acute angle with the stem than do those of ssp. *agrestis* (Trimen's *Friesii*) is in general true of the colonies the writer has studied. The lower stem and rosette leaves of *transiens* (normal L/B. ratio of the lamina 8 : 6.5) are very much broader than those of *agrestis* (10.5 : 4), also the leaves of the former are much more abruptly contracted to the apex from a relatively broader base, and the pubescence on the mid-rib on the underside of the leaf is very much less in *transiens* than in the commoner subspecies.

The characters of this plant are intermediate between those of *agrestis* and *sylvestris*, but Rechinger has given convincing reasons why it should not be considered as a hybrid between those subspecies (*loc. cit.*, 53).

Subsp. SYLVESTRIS (Wallroth) Rechinger pat., *OBZ.*, *42*, 51, 1892; *R. sylvestris* Wallroth, *Sched. crit.*, *1*, 161, 1822; *R. obtusifolius* L. a. *silvestris* Fries, *Novit. Fl. Suec.*, ed. 2, 98, 1828; *R. obtusifolius* L. β *microcarpa* Dierbach in Geiger, *Mag. Pharm.*, *4*, 16-21, 1826 (*teste* Rechinger fil.).

Icones. Rechinger fil., *BBC.*, *49*, t. 2, fig. 15; Danser, *Ned. Kruid. Arch.*, *1921*, t. 1, figs. 7 and 9, 1922; Beck in Rchb., *Icones*, *24*, t. 180, 1904.

Exsicc. 17, Surrey; Mitcham Junction, Lousley (52)—*teste* Rechinger. 20, Herts.; Stanstead St Margarets, Lousley (130)—*teste* Rechinger; Wormley, Britton (3539).

Fruiting valves narrow lingulate or narrow ovate-triangular, acute or rather obtuse, 3-4½ x 2-2½ mm., entire or with obsolescent teeth near the base; all tubercled, the tubercles usually subequal, rarely two of them smaller than the others, usually taking up over half the width of the valve. Plant completely glabrous.

Distribution. A rare alien of which I have seen only the above material from Britain. At the Mitcham Junction station only a single plant was observed, but the subspecies appears to be persistent along canal-sides in Hertfordshire.

Distribution abroad. Eastern Europe from South Sweden, Central Germany, Hungary and Austria eastwards to Poland and Russia. Introduced in a few stations elsewhere.

Wallroth's *Exsicc.* No. 18 (ex Thalleben in Thüringen) is somewhat misleading as the various sheets distributed are not absolutely uniform. There is no doubt that all those seen represent his *R. sylvestris* but some of them are not good examples of the extreme form which Rechinger regards as typical.

No material which could definitely be assigned to ssp. *sylvestris* has been seen from the banks of the Thames. Rechinger fil. (*loc. cit.*, 60) cites "Bank of Thames, Kew, Surrey (G. Nicholson)" and "By the Thames betw. Putney and Barnes (C. E. Britton)" for this subspecies, but of the first gathering he adds "Nicht typisch, Übergang zu ssp. *transiens*." and the material of the gathering of Mr Britton's which I believe to be intended (Ref. 210) is too immature to be satisfactorily determined. Until further evidence is forthcoming only *transiens* can be accepted as growing by the Thames.

From the scanty material seen it appears that the leaf-shape of this subspecies in Britain approximates closely to that of ssp. *agrestis*, and thus differs from ssp. *transiens*.

[Subsp. SUBALPINUS (Schur) Simonkai, *Enum. Fl. Transs.*, 472, 1886; *R. obtusifolius* L. a. *subalpinus* Schur, *Enum. Pl. Transs.*, 579, 1866.

Icones. Rechinger, *BBC.*, *49*, t. 2, fig. 18.

Fruiting valves narrow triangular, acute, *c.* 5 mm. long, one strongly tubercled, all with the margin toothed near the base; teeth usually three on each side, less than half the width of the valve in length. Plant usually completely glabrous.

Distribution abroad. Mountain and subalpine regions of the Carpathians, the Balkans, Persia, Caucasus and the Crimea; sporadically in Central Europe and Russia.

There is no definite evidence of the occurrence of this subspecies in Britain. On specimens of *R. obtusifolius* L. from Barry Dock, Glamorgan (163), and Avonmouth Docks, W. Gloucester (162), Rechinger wrote as follows:—"These two gatherings recall the ssp. *subalpinus* from S.E. Europe but could be quite as well an unusually small fruited form of ssp. *agrestis*." The material was gathered late and was obviously not good enough for a stable determination of a critical plant—especially as ssp. *subalpinus* is of all the four segregates of *R. obtusifolius* the one of which Rechinger has seen least material.]

618/7 and 8. R. SANGUINEUS L., *Sp. Pl.*, 334, 1753.

There can be no doubt from the diagnosis and synonymy given in *Species Plantarum* that Linnaeus had in mind the aggregate species to which this name is generally applied. The type specimen in the Linnean herbarium is labelled "2 sanguineus" in Linnaeus' handwriting, and it was most probably in his collection before 1753. This sheet bears a flowering spike and a leaf which still shows broad purple veins indicating that it belongs to the plant described below as var. *purpureus* Stokes. One would have expected therefore that Linnaeus would have made some mention in his description of such a conspicuous character, but whereas he quotes in synonomy authors who did recognise this feature, he mentions coloration only in connection with the tubercles. Neither is it possible that he made the omission deliberately with a view to the inclusion of the green-veined plant (var. *viridis* Sibthorp), which was almost certainly known to him, since the only locality cited is "Habitat in Virginia."

There is no form of *R. sanguineus* known to be native in the continent of America, though the species has been recorded by many authors as an introduction in North America. There is no necessity to suppose that Linnaeus was in error in stating that the plant grew in Virginia since at least six of his correspondents sent him botanical material from North America, and two of them (John Clayton and John Mitchell) are known to have stayed in Virginia. At the time of the publication of *Species Plantarum* the Virginian colony had been in existence for 147 years. We know that during that period *R. sanguineus* var. *purpureus* Stokes was in demand in Europe as a pot herb and for medicinal purposes (see below), and it is therefore not unreasonable to postulate that it was grown by the Virginian colonists, and that it may even have become temporarily established as a naturalised plant. The fact that it was the purple-veined form which was sent to Linnaeus adds support to this theory.

It is proposed to follow the practice of most recent continental authors in uniting the green and purple veined segregates of the aggregate *R. sanguineus* under a single species as follows:—

Var. a. PURPUREUS Stokes, *Bot. Mat. Med.*, *2*, 302, 1812; *R. sanguineus* a. *genuinus* Koch, *Syn. Fl. Germ. et Helv.*, ed. 1, 613, 1837; *R. sanguineus* auct. angl.

Pre-Linnean synonomy: *Lapathum sativum sanguineum* Johnson in *Gerard Herb.*, ed. 2, 390, 1636; *L. sanguineum* Parkinson, *Theatr. Bot.*, 1226, 1640; *Lapathum folio acuto rubente* Morison, *Plant. Hist.*, *2*, 579, 1680-99; Ray, *Syn.*, ed. 3, 142, 1724.

Exsicc. 34, W. Gloucester; Clifton, Bristol, Lousley (164); and Hort. Streatham ex Ash ex Wilmott ex Foggitt (from Guernsey), Lousley (173).

Leaves with purple veins, stem and panicle branches often suffused with purple.

The colour of the veins of this plant has been variously described as "red," "crimson," "dark red," "dark crimson," and "blood-red" by various authors, while Stokes (*op. cit.*) states that they are "brownish purple." It is by no means an easy colour to describe in words, but to the writer's eye it is purple rather than any shade of red.

Numerous attempts have been made to find other distinctions between this plant and the one which follows, but when applied to living and dried material they have all proved completely unreliable. The excellent descriptions given by Moss (*Camb. Br. Fl.*, *2*, 145-6, 1914) of *R. sanguineus* and *R. condylodes* show differences which hold good in many specimens, but these differences are probably attributable to the fact that most herbarium specimens of the former have grown under full exposure to sun, while the latter is usually collected from the shade of woods, copses, and hedgebanks. Salmon made a praiseworthy effort to find a difference between the valves and nuts of the two species (*S.E. Nat.*, 49-50, 1928, and *Fl. Surrey*, 565, 1931), but I am unable to agree to his measurements, and Little (*B.E.C. 1931 Rep.*, 839-840, 1932) after careful examination came to a similar conclusion.

It is well known to amateur botanists that var. *purpureus* in cultivation comes up constant from seed over long periods. This fact is mentioned by Syme (*E.B.*, *8*, 42) and Druce (*Fl. Berks.*, 431, 1897), and I can confirm it from observation of the plants in the garden of the South London Botanical Institute where no variations have appeared. In "wild" stations when left undisturbed it may be equally constant —for example, I saw it in 1938 at a locality at Clifton, Bristol, where J. W. White noticed it in 1897 (*Fl. Bristol*, 514, 1912). There is no apparent reason why the plants in cultivation in botanic gardens today should not be lineal descendants of those known to pre-Linnean botanists.

The plant was first recorded for Britain in 1636 by Johnson, who states:—" This fifth kinde of Docke is best knowne unto all, of the stocke or kindred of Dockes . . . " (*op. cit.*, *2*, 390), and this is explained by his remark that it was " sowne for a pot-herbe in most gardens." Since we know that *R. sanguineus* is not native in the New World, and that it is most unlikely that it would be introduced in Virginia before the first settlement there in 1607, Johnson's statement in 1636 that it was grown " in most gardens " makes the assertion of later authors that " It migrated from Virginia to Hampstead in England " (Withering, *Arr. Br. Pl.*, *2*, 346, 1801) almost impossible.

Ray (*op. cit.*, 142) clearly indicated that he did not know the plant as a native—" Sicubi occurrat in viis publicis et ad semitas, hortorum rejectamentis originem suam debere suspicor." He gave medicinal uses for the herb.

To-day no undoubted native station for var. *purpureus* is known in any country of the world. In Britain the least suspicious locality is the island of Guernsey, where it is said to be common, but apparently restricted to roadsides and waste-places (Marquand, *Fl. Guernsey*, 161, 1901). It seems that in every place where true *purpureus* has been recorded in Britain a garden origin is probable.

It is suggested as a hypothesis that the purple-veined plant originally arose as a mutant growing in a colony of the native green-veined var. *viridis* in Western Europe. Such a striking plant would immediately attract the attention of an ancient herbalist as likely to have curative properties, and thus it became transplanted into a herb-garden. Coming true from seed, and with the character probably intensified by the greater exposure to light under garden conditions, and perhaps also owing to isolation from the green-veined plant, the plant would rapidly spread by the distribution of seed throughout the herb-gardens of Western Europe. Thence it appears that it became occasionally introduced into semi-wild habitats.

My attention was drawn by Mr Wm. Watson in 1934 to an interesting plant growing in a moist roadside copse near Brook, Witley, Surrey. In spring a small number of individuals in this colony have purple veins to all the leaves, while the great majority have the concolorous leaf-veins of *viridis*. In July and August some of the fruiting plants have narrow purple veins to the stem leaves (Lousley (22)), while the stem is green and not dark coloured as in true *purpureus*. One individual of this phenotype was transplanted to my garden and by November it had developed purple veins to the root leaves which were almost identical with those of true *purpureus* (Hort. Ash ex Wilmott ex Foggitt—Lousley (173)) in an adjoining pot. It is thought that this Witley plant may be a mutant of the same nature as *purpureus* but less extreme. In nature the shade afforded by the leafage of the surrounding trees and shrubs may prevent the full expression of the genetic character during the summer months. It may be that such a plant brought into a sun-exposed garden, and isolated from the crossing influence of *viridis*, would in the course of a few generations produce individuals as extreme as the *purpureus* of present cultivation.

Var. b. VIRIDIS Sibthorp, *Fl. Oxon.*, 118, 1794; *R. condylodes* Bieberstein, *Fl. Taur.-Cauc.*, *1*, 288, 1808; *R. nemorosus* Schrader ex Willdenow, *Enum. Hort. Berol.*, 397, 1809.

Exsicc. 26, W. Suffolk; Risby, Lousley (141).

Leaf-veins and stem green or occasionally flushed with rusty red.

The fact that the forms of *viridis* with rusty red veins belong here rather than to the purple-veined *purpureus* was indicated by Moss, who described them as *R. condylodes* forma *sanguinalis* in *Camb. Br. Fl.*, *2*, 146, 1914. He was in error, however, in stating that they occurred only during the autumn months. Many of the records for *purpureus* belong to this form—such as a plant shown to me near Penzance by a local botanist in June 1934.

Normally this variety is a shade plant with thin, dark green leaves, and panicle branches often spreading at an angle of as much as 60°. Under extreme shade conditions the panicle may be little branched (Lousley (141), Risby, W. Suffolk). Plants growing in full sun exposure however have a very different appearance, and the leaves are then smaller, thicker, and narrower, and the long leafless panicle branches make an angle of less than 30° with the main stem (Lousley (69), Littleworth Common, Surrey; (55), Mitcham Junction, Surrey; (37), Pit near Burpham, W. Sussex).

Very few authors have accurately described the tubercles of *R. sanguineus* var. *viridis*, and while it is true that only one valve bears a large conspicuous tubercle, yet it is usual to find smaller though less well-formed tubercles on at least one of the other valves. This is true even on plants of the most extreme form (Lousley (141), Risby, W. Suffolk). It is therefore only when material is sufficiently ripe for the tubercles to have reached their maximum development that *viridis* can be distinguished from *R. conglomeratus* by the absence of fully-formed tubercles on two of the valves. Well-developed tubercles of *viridis* are almost globular, whereas those of *conglomeratus* are often twice as long as broad.

Danser (1922/A : 200) divides *R. sanguineus* L. *sensu lato* into two varieties as follows:—

> " *trigranis*, perigonia fructifera omnino evoluta granis ternis ornata.
>
> *unigranis*, perigonia fructifera singulo grano ornata."

He thus recognises in Holland a trigranulate variety of the species in addition to his *unigranis*, which is the common plant.

In this country trigranulate " *sanguineus* " (by which *R. sanguineus* L. var. *viridis* Sibth. was intended) has been mentioned in print on several occasions, but I have not yet seen any specimens which I should so refer. It is true that *R. conglomeratus* Murray var. *Borreri* Trimen (see below) has some of the characters of *R. sanguineus* L. var. *viridis*

Sibth., and Trimen stated that "it might almost as well come under *nemorosus*" (*Journ. Bot.*, *14*, 4, 1876). Nevertheless in my opinion *Borreri* definitely comes under *conglomeratus* and not under the present species.

Specimens (in Hb. Mus. Brit.) distributed by Augustin Ley with labels as stated I determine as follows:—

(1) *R. nemorosus* Schrad. trigranulate variety, Traethmawr, Portmadoc, Carnarvonshire, 12th August 1886, *B.E.C. 1886 Rep.*, 158, 1887, is a small sub-simple *conglomeratus*.
(2) *R. sanguineus* L. *trigranulatus*. River beach, Sellack, Herefordshire, 6th August 1887, *B.E.C. 1887 Rep.*, 188, 1888, is *R. conglomeratus* Murray var. *Borreri* Trimen.
(3) *R. sanguineus* L. *trigranulatus*. Waste ground, Hentland, Herefordshire, 15th September 1890, is weak straggling *conglomeratus*.
(4) *R. sanguineus* L. var. *trigranulatus*. Meadow, Wilton, Herefordshire, 10th August 1892, *B.E.C. 1892 Rep.*, 384, 1893, is *R. conglomeratus* Murray var. *Borreri* Trimen.

The "trigranulate *nemorosus*" referred to by Trimen (*Journ. Bot.*, *14*, 3, and 310, 1876), of which the original specimen collected by Warren on Lewes Levels, E. Sussex, in August 1874, is in Hb. Mus. Brit., proved to be merely an abnormal secondary growth of *R. conglomeratus* from a stem which had been cut down earlier in the year.

R. sanguineus L. var. *viridis* Sibth. is a common plant of the south of England, Wales, and Ireland, becoming less frequent in the extreme north of England and in Scotland. In order to check the vice-comital distribution and frequency in Scotland material in ripe fruit is required from all parts of that country, and especially from the west coast, where unusual forms appear to occur.

617/9. R. CONGLOMERATUS Murray, *Prod. Stirp. Gotting.*, 52, 1770; *R. glomeratus* Schreber, *Spicil. Fl. Lips.*, Index 155, No. 300, 1771; *R. paludosus* Withering, *Bot. Arrangement Brit. Pl.*, ed. 3, *2*, 354, 1796; *R. acutus* Smith, *Fl. Brit.*, *1*, 391,* 1800, and *English Botany*, *11*, 724,* 1800.

Exsicc. 17, Surrey; Mitcham Junction, Lousley (168).

R. acutus L., *Sp. Pl.*, *1*, 335, 1753, is best regarded as a *nomen confusum*. His description states that the valves are toothed, which excludes any form of *R. conglomeratus*. Some of the synonomy, however, probably refers to this species, and there are two sheets pinned together in Hb. Linn., which were probably there in 1753, and are clearly *conglomeratus*. The first sheet (No. 15) bears a specimen in good fruit, and the label "*acutus* 10" in Linnaeus' handwriting, and "Hispania 277 a Loefl." on the back. The second (No: 16) is in flower only and labelled "*Lapathum acutum minimum* Mill." on the back. Many authors have

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*I have been unable to decide which of these two descriptions by Smith is the earlier—see Wiltshear in *Journ. Bot.*, *53*, 34, 1915.

supposed that *R. acutus* L. was *R. crispus* L. × *R. obtusifolius* L., but this conclusion is open to grave doubt.

Normal mature *R. conglomeratus* is easily distinguished from *R. sanguineus* var. *viridis* by the more spreading habit, the presence of leafy bracts which extend to at least halfway up the branches, the narrower and coarser leaves, the shorter peduncles of the fruit, and the presence of large well-formed elongate tubercles on all three valves.

Not having seen the type specimen I follow Trimen (*Journ. Bot.*, *14*, 3, 1876) who wrote: " The type of this species may be considered to be a straggling plant with divaricate branches, broad-based stem leaves which accompany every whorl except the very terminal ones, and small fruit." This is a frequent form of marshy meadows and is *R. glomeratus* sub-var. *divaricatus* (Thuillier) Moss, *Camb. Br. Fl.*, *2*, 143, t. 147, 1914.

In such a state *R. conglomeratus* cannot be confused with *R. sanguineus* var. *viridis.* Nevertheless *R. conglomeratus* is a very variable species, and a considerable number of intermediates between it and *viridis* occur in Britain. Identification of such intermediates often presents some difficulty, and they have led to considerable confusion in the past.

The frequent presence of tubercles on more than one valve of *viridis* has been discussed above, and it is clear that absolutely mature material is essential if the tubercle character is to be relied upon.

An additional complication arises from the fact that, whereas *conglomeratus* is normally a plant of marshy meadows, and *viridis* a plant of shady habitats, either may occasionally be found on the other's ground, when the vegetative characters are accordingly modified.

Forma SUBSIMPLEX (Trimen) mihi, comb. nov.; *R. conglomeratus* Murray var. *subsimplex* Trimen, *Journ. Bot.*, *15*, 134, 1877.

Type. Small Common near Runton, Cromer, Norfolk, August 16th, 1876, H. Trimen in Herb. Mus. Brit.

Trimen's sheet bears three specimens of a small, neat, erect form. They are almost simple, having only a few branches near the base, none of which exceeds 3.5 cm. in length. The fruits are those of normal *conglomeratus.* Although Trimen described *subsimplex* as a variety, it is labelled " *form* subsimplex " in his handwriting, and there can be no doubt that it deserves no higher rank.

The most important of the plants offering mixed characters is:—

Var. BORRERI Trimen, *Journ. Bot.*, *14*, 310, 1876 (which should be read in conjunction with Trimen, *loc. cit.*, 3).

Syn-type. Warren, Burgess Hill, Sussex, 20th August 1876, in Herb. Mus. Brit.

The type sheet bears a specimen *c.* 55 cm. tall, with erect branches making an angle of 30°-45° with the main stem. Branches leafless, or with a few leaves near the base of the larger lower ones. Leaves somewhat acute, with wavy margins.

The essential feature of this variety is that it has the general vegetative features of *viridis* combined with the typical trigranulate fruits of *conglomeratus*. The variety is far from common and, in addition to the gatherings of Ley mentioned under the preceding species, I have only seen the following examples:—

(1) Without locality, but labelled "*R. sanguineus* β Sm., somewhat leafy, approaching *R. acutus* Sm." in Hb. Borrer.
(2) Lewes, 30th July 1853, J. Woods in Hb. S.L.B.I.

Field experience of this plant is required before it can be definitely stated whether it justifies varietal rank.

It has been suggested that plants such as *Borreri*, presenting intermediate characters between *conglomeratus* and *viridis*, may be hybrids between those species. This may possibly be the case, but I am not yet convinced that such intermediates occur only when both the putative parents are within pollination range. Furthermore, the plants presenting intermediate characters are uniformly fertile, whereas definitely reported hybrids between the two species are extremely infertile. As Moss remarks (*Camb. Br. Fl.*, *2*, 146, 1914), one would expect two such closely allied *Lapathum* species, which commònly grow in close propinquity, to produce hybrids more commonly than appears to be the case. This question is one which can only be settled by the artificial production of hybrids in the experimental garden.

Distribution. *R. conglomeratus* is extremely common and widespread throughout the lowlands of England and Wales. In Scotland it is rare, and thoroughly ripe material from every part of that country is required to check the vice-comital distribution. From the scanty, and usually very immature, Scottish material seen up to the time of writing, it appears likely that unusual forms of *conglomeratus* occur towards the northern limit of its range.

618/10. R. RUPESTRIS Le Gall, *Congrès scientifique de France, 16e session, Rennes, 1849, 1*, 143-4, 1850 (There is a manuscript copy of this description attached to a sheet from Gay in Hb. Kew. A later, but probably more generally accessible, reference is Le Gall, *Fl. Morbihan*, 501, 1852); *R. conglomeratus* Murray var. *orthoclada* Gay inedit., on herbarium sheet from Carteret, Manche, 1831, in Hb. Kew.

Icones. Trimen in *Journ. Bot.*, *14*, t. 173, 1876; Moss, *Camb. Br. Fl.*, *2*, t. 148, 1914.

Exsicc. 1, W. Cornwall; Perranporth, leg. F. Rilstone, Lousley (174). 41, Glamorgan; Kenfig Dunes, Lousley (157).

This species varies extremely little throughout its range. In Britain it occurs in two types of habitat:—(a) On cliffs, as about Polperro and Newquay in Cornwall; at the base of cliffs just above high-water mark as at Whitesand Bay, E. Cornwall; or on rocky shores as on the uninhabited islands of the Scillies. (b) In dune-slacks which are filled with water during the winter, but dry in summer, as at Perranporth, W.

Cornwall, and Kenfig, Glamorgan. In both cases the ecological conditions are very similar—an underground supply of moisture and great heat during the summer months. I am not aware of any station where *R. rupestris* has occurred at a greater distance than half-a-mile from the open sea. From garden experience it is significant that the young plants are extremely susceptible to cold weather, being cut back at the first autumn frost. The eastern limit of the species in Britain roughly approximates to the course of the January 42° mean isotherm, and it is probable that the extension of the range eastwards is limited by the inability of the juvenile plants to endure the drier colder conditions.

The *Distribution in Britain* is as follows, the first mentioned specimen being given as a voucher for the vice-county:—

1a, Isles of Scilly; Old Town, St Mary's, 1873, Beeby (Hb. Mus. Brit. and Hb. S.L.B.I.). The plant is still frequent on the shores of both inhabited and uninhabited islands.

1, W. Cornwall; Gunwalloe, Cunnack (Hb. Syme). Local, but stations scattered round the whole coast.

2, E. Cornwall; Whitesand Bay, 1877, Briggs (Hb. Mus. Brit.). Locally common throughout the length of the south coast; I have not yet seen any material from the north coast.

3, S. Devon; Bigbury Bay, 1875, Briggs (Hb. Mus. Brit.). Frequent from the western boundary along the coast to Salcombe.

4, N. Devon; Braunton Burrows, 1882, Ley (Hb. Mus. Brit.). No other material seen.

41, Glamorgan; Three Cliffs Bay near Swansea, 1859, Bentham (Hb. Kew). It also occurs in quantity in dune-slacks at Kenfig, where I have seen it on two occasions through the courtesy of Miss Vachell. The Kenfig plant is usually shorter and less strict than material from the S.W. Peninsula.

Channel Isles. Jersey; St Aubins, 1885, Ley (Hb. Mus. Brit.)—specimens also seen from Beaumont, St Peter's Marsh, and Corbière. Guernsey; Plémont, 1893, Dawber (Hb. Mus. Brit.).

Further evidence is required before the records for the following vice-counties can be accepted:—

9, Dorset. Given for this county in *Comital Flora*, but I have been unable to trace the authority.

11, S. Hants. Given on the authority of J. Woods in *Topographical Botany*, ed. 2. There is no Hampshire specimen in Hb. S.L.B.I. in which the collection of Joseph Woods is incorporated. See also Hall in *B.E.C. 1933 Rep.*, 563, 1934.

13, Sussex, W. (?). This is given in *Topographical Botany*, ed. 2, as "13 Sussex e. J. L. Warren ms.," which is ambiguous as East Sussex is v.-c. 14. The record is probably based on plants labelled "*R. rupestris ?*" gathered on Lewes Levels, E. Sussex in August 1874 by J. L. Warren (Hb. Mus. Brit.)—see *Journ. Bot.*, *13*, 337, 1875. The specimens are secondary growths of undoubted *R. conglomeratus*.

Careful search should be made for this species on the coast of Carmarthen and Pembroke, and also on the south and S.W. coasts of Ireland.

618/11. R. PULCHER L., *Sp. Pl.*, 336, 1753.

Icones. As under subspecies—but a really good plate of the species from Britain has yet to be published.

Type. Hb. Linn., No. 19, labelled " pulcher 12 " in the handwriting of Linnaeus and " H.U." (Hort. Upsala). This sheet, which bears two panduriform leaves and a small fruiting branch, is ssp. *eu-pulcher* Rech. fil. Sheet No. 20 carries a complete plant of *R. pulcher* in flower, but was not labelled by Linnaeus. The species does not occur as a native in Sweden.

R. pulcher is a well-defined species which is not easily confused when once the essential characters are understood. Too much reliance has been placed in the past on the panduriform shape of the leaves—a character which is not an infallible guide even in the native subspecies, and which is frequently absent in introduced plants. *R. conglomeratus* frequently has fiddle-shaped leaves, and occasionally they also occur in *R. obtusifolius* (f. *pandurifolia* (Borbas)). Specimens of the last species are fairly frequently misnamed as *R. pulcher* in herbaria, and this error may generally be avoided if it is remembered that the lamina of *pulcher* rarely exceeds 10 cm. in length.

When gathered in ripe fruit *R. pulcher* is not easily confused with any other species. It is characteristically of low sturdy growth, rarely more than 50 cm. tall, with spreading branches making a very wide angle with the stem (often nearly 90°). The peduncles of the fruit are thick, jointed above the middle, and shorter than the valves. The valves are coarse, all tubercled, usually with strong teeth, and reticulate with thick nerves with pits in their interstices.

Rechinger (1932: 25-41) has divided *R. pulcher* (*sensu lato*) into five subspecies, three of which have occurred in Britain. The following key is adapted from the one given by him (1932: 26):—

Valves entire, or with 1-2 teeth at the base which do not exceed
    ½ mm. in length .... ssp. *anodontus* (Hausskn.) Rech. fil.
Valves with several teeth which are more than ½ mm. long.
    Valves roundish in outline, with short broad entire apex,
        each margin with up to 8 often cleft teeth ... ssp. *divaricatus* (L.) Murbeck.
    Valves oblong or ovate-triangular, 4½-5 mm. long, with at
        most four 1-2 mm. long teeth on each margin ... ssp. *eu-pulcher* Rech. fil.

Subsp. EU-PULCHER Rechinger fil., *BBC.*, *49*, 26, 1932; *R. pulcher* auct. angl.

Icones. Rechinger, *loc. cit.*, t. 2, fig. 10; Moss, *Camb. Br. Fl.*, *2*, t. 146 (leaves too pointed, margin too crisped, fruit poor); Fitch & Smith, *Illustr. of the Br. Fl.*, fig. 864 (branches too erect); Smith, *English Botany*, t. 1576 (separate fruit has inaccurate outline, veins too indistinct, and peduncle too thin).

Exsicc. 17, Surrey; Shalford Common, Lousley (1)—*teste* Rechinger. 20, Herts.; Windmill Hill, Hitchin, Little (560) (Hb. Mus. Brit.).

Panicle much branched, the branches rather slender and drooping at the ends when in flower, usually horizontally spreading and interlaced to form an entangled mass in fruit. Fruiting valves oblong- or ovate-triangular, often unequally tubercled, apex acute or obtuse, each margin with about 4 teeth which in length are at most equal to half the width of the valve. Lower leaves usually panduriform.

Distribution in Britain. Native in dry sunny situations such as commons, roadsides, the base of walls, and churchyards; often on sandy soil, less frequently on chalk or limestone. Common locally in the south of England, especially near the coast, becoming rarer northward. England south of a line drawn S.W. from the Humber, Wales in the coastal districts of the S. and N.W., Ireland on the south coast, where it is rare and perhaps introduced.

In view of the previous inclusion of records of other subspecies, failure to distinguish between records of native and introduced plants, and occasional confusion with other species, it is necessary to revise the vice-comital distribution of *R. pulcher* ssp. *eu-pulcher*. Details of the supporting specimens will be included in a future instalment of these notes. Material of the subspecies has already been seen from the following v.-cc.:—1 to 4, 6, 8-11, 14-27, 29, 30, 32-35, 37, 38, †41, 55, 56, 68, H.6.

Material from the following, from which the plant is recorded, has not yet been seen:—V.-cc. 5, 7, 12, 13, 28, 31, 36, 39, 44, 45, 47-50, 53, 54, 57, 65, 67, 70, 75, 77, 80. Some of these records are known to have been for introduced plants. All Irish material will be welcome.

Distribution abroad. Around the Mediterranean and Black Sea; Hungary and the Balkans; western Europe from Gibraltar to England.

Life History. The leaves of this plant, unlike those of most of our *Lapatha*, are fully formed and apparently active throughout the winter months. During the warmest part of the summer they tend to disappear, and there is often great difficulty in gathering leaves even from neighbouring barren plants at the time when fruiting material is collected. The adaptation of this species to Mediterranean habitats is therefore to be seen in its activity during the winter months (which probably also explains its inability to spread northwards), its dormancy during the summer drought, and its affinity for warm sunny places.

R. pulcher commences to flower in June several weeks earlier than most of the British Docks, and after flowering the leaves decay and the stem rots away at the base. The fruits are persistent and not easily detached from the branches, which form an interlaced mass. When the stem and panicle is hard and dry the whole structure is easily knocked free and dragged or kicked about on the feet of grazing or passing animals. The fruits are by this means removed from the immediate vicinity of the parent plant.

Germination, as is the case with most Docks, is not restricted to a limited period of the year. In nature it certainly takes place on a large scale after rainy periods in September and October, but it has also been induced in cultivation in early May.

Subsp. ANODONTUS (Haussknecht) Rechinger fil., *BBC.*, *49*, 34, 1932; *R. pulcher* L. var. *anodonta* Haussknecht, *Mitt. Thür. B.V.*, *1* (*N.F.*), 34, 1891; *R. pulcher* L. f. *anodus* Beck in Reich., *Icones*, *24*, 39, 1904.

Icones. Rechinger, *loc. cit.*, t. 2, fig. 11.

Exsicc. 20, Herts.; Gravel Pit, Ware, August 1908, *B.E.C. 1909 Rep.*, 418. 1910, Druce (Hb. Druce).

Less branched than ssp. *eu-pulcher*, the branches more erect, less slender at their extremities, much less entangled. Fruiting valves triangular-oblong, margin entire or with 1-2 small teeth on each side which are at most ½ mm. in length. Basal leaves often not panduriform.

Distribution. In Britain a very rare alien. Dr Druce's specimen cited above is the only one I have seen which certainly belongs here. The two following sheets carry unripe material which probably belongs to ssp. *anodontus*, but the identification can be only tentative:—

63, S.W. Yorks; By Malt Kiln, Mirfield, 3/8/09, and Sutcliffe's alien ground, M'fd. (presumably the same station), 9/09, both ex Hb. F. Arnold Lees in Hb. Mus. Brit. as *R. pratensis* M. & K.

Distribution abroad. S.W. Asia from Persia to Asia Minor. Palestine and Syria, also N. Africa.

Subsp. DIVARICATUS (L.) Murbeck, *Beitr. z. Kenntnis d. Fl. v. Südbosn. & d. Herzeg.*, 45, 1891; *R. divaricatus* L., *Sp. Pl.*, ed. 2, 478, 1762.

Icones. Rechinger, *BBC.*, *49*, t. 2, fig. 12; Beck in Rchb., *Icones*, *14*, t. 183, fig. 3, 1904; Coste, *Fl. France*, *3*, t. 3128, 1906 (fruit only).

Exsicc. 77, Lanark; rubbish-heap near Glasgow, Grierson—*teste* Rechinger (Hb. Kew).

Habit as in ssp. *anodontus.* Fruiting valves ovate-orbicular, with entire, rounded or broadly acuminate apex; margin on each side with 4-6 (-8) teeth which at most equal half the width of the valve and are frequently much shorter; valves often unequally tubercled. Leaves rarely panduriform.

Distribution. In Britain an uncommon and transient alien, of which specimens have been seen from the following vice-counties:—

13, W. Sussex; Hove, 1877, J. L. Warren (Hb. Mus. Brit.).
17. Surrey; *Kew, Nicholson (Hb. Lund—*teste* Rechinger).
77, Lanark; Glasgow—see above.
80. Roxburgh; Kelso, 1877 and 1878, Brotherston (Hb. Syme).

A number of specimens of unripe adventive *pulcher* from other localities have also been seen. Most of these probably belong to the present subspecies, which perhaps seldom ripens in this country except in very warm summers. It may be more than a coincidence that two of the ripest specimens seen were gathered in 1877, and probably ssp. *divaricatus* is more frequent than the above records suggest.

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*This specimen must have been from a rubbish-dump or similar habitat, and the record should not be confused with those of ssp. *eu-pulcher*, which persisted until recently in several places at Kew.

Distribution abroad. Scattered through the coastal parts of most of the countries bordering the Mediterranean and Black Sea—adventive elsewhere.

618/12. R. PALUSTRIS Smith, *Fl. Brit.*, *1*, 394,[*] 1800, and *English Botany*, *11*, 725,[*] 1800 (last paragraph under account of *R. maritimus* L.); *R. limosus* auct. angl., *non* Thuillier; "Gold Dock" Petiver, *Herb. Brit.*, tab. 2, fig. 7,[**] (?) 1713; *Lapathum aureum* Ray, *Syn.*, ed. 3, 142, 1724; Hill, *Fl. Brit.*, 193, 1760; *R. maritimus* β Hudson, *Fl. Angl.*, ed. 2, 155, 1778.

Icones. Curtis, *Fl. Lond.*, t. 163; Butcher & Strudwick, *Further Illustr.*, t. 321 (excl. Z).

Exsicc. 17, Surrey; Mitcham Junction, Lousley (25). 21, Middlesex; Hendon, Lousley (126).

Type Specimen. St George's Fields, London, Mr E. Forster, 1800 in Hb. Smith.

It will be clear from the above that in publishing *R. palustris* in *Flora Britannica* Smith merely gave a post-Linnean name to a plant which was already well known to be distinct from *R. maritimus*. He cited "by Acle Dam, Norfolk, Mr Pitchford," and there is a specimen in his herbarium collected by that botanist there in 1781. This specimen, however, is immature, and it is considered advisable to pass it over in favour of the sheet in Hb. Smith labelled *R. palustris* Fl. Brit. in Smith's handwriting, collected by E. Forster at St George's Fields in the year of publication of the description. It is true that this plant must have been gathered later in the year than the date of the preface to Smith's work, but the fact that the specimen is a very good one from a locality which had been very well known to London botanists since the discovery of the species there in 1709 by Isaac Rand (Salmon, *Fl. Surrey*, 566, 1931), and from a locality cited by Petiver, Ray, and Curtis who were all quoted in synonomy by Smith, appears to indicate that it should be selected as the type specimen. There is one other specimen which has some claim to be considered in the nomination of the type of *R. palustris* Smith. In the Linnean herbarium there is a sheet numbered "14" which bears an immature unlocalised and undated specimen labelled "Rumex palustris Fl. Brit. 394" and "73. Lapathum R. Syn. 142. 10" in Smith's handwriting. Presuming that the specimen was not added to the collection by Smith, it must have been in his hands in 1800, but there is no evidence that he had it in mind when he wrote his description, or of the lapse of time after 1800 before he added his determination. It therefore seems advisable to pass this specimen over in favour of the sheet already cited.

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[*] I am unable to decide the priority of these two descriptions with certainty—see Wiltshear in *Journ. Bot.*, *53*, 34, 1915. The account in *Flora Britannica* is a full one whereas that in *English Botany* is merely an incidental note. It is therefore proposed to regard the first as the original description of the species.

[**] I have been unable to discover the exact date of Petiver's *Herbarium Britannicum*, and therefore give the one suggested by Trimen & Dyer in *Fl. Middlesex*, 381, 1869. Hudson quotes it as 1702 (*Fl. Angl.*, ed. 2, xxxvi, 1762), and it is certainly before 1724, being cited by Ray in his *Synopsis*, ed. 3, of that year. Most copies are bound up as No. 8 of Vol. II of a collection of Petiver's miscellaneous works under the title of "Jacobi Petiveri Opera Historiam naturalem spectantia" with a new title page dated either 1764 or 1767.

Two inexplicable errors were made shortly after Smith's publication. In the following year Withering (*System. Arrangem.*, *2*, 349, 1801) transposed, with some additional inaccuracy, the names *maritimus* and *aureus*, giving each the synonyms and localities of the other. Smith, although he evidently understood the plant well in 1800, passed as a plate for *English Botany*, *27*, t. 1932, 1808, an illustration which most certainly did not represent his species. The young flowering stem which comprises most of this plate was apparently drawn from a plant preserved in Sowerby's herbarium (Hb. Mus. Brit.). This specimen is certainly a hybrid, but whether it is *R. crispus* × *obtusifolius* as suggested by Syme (*E.B.*, *9*, 44, 1868) is somewhat doubtful.

Most British and many continental authors have used the name *R. limosus* Thuillier (*Fl. des Env. de Paris*, ed. 2, 182, 1799) for this species. Thuillier's description, however, fails to stress the essential differences between this plant and *maritimus*, and might equally well apply to *R. conglomeratus* × *maritimus*, which is a not infrequent hybrid. Moreover, he cites Curtis' plate 163, which is an excellent representation of *R. palustris*, as illustrating his *R. maritimus*.

Statements have been frequently made in Exchange Club reports and elsewhere that "*limosus* is a hybrid." In cases where the meaning has been that Thuillier's plant was a hybrid this is correct, but the intended inference has often been that *palustris* itself was a "hybrid-species." A lengthy paper endeavouring to prove this theory by Gillot & Parmentier (*BSB. Fr.*, *44*. 325-9, 1897) has been accepted by Rouy (*Fl. Fr.*, *12*, 79 footnote, 1910), Ascherson & Graebner (*Syn.*, *4*, 757, 1908-13), and other authorities. The theory that *R. palustris* is a hybrid between *conglomeratus* and *maritimus* was refuted in an able paper by Murbeck (1913: 201-215), who showed that *R. palustris* has all the characteristics of a good species. He also states (*l.c.*, 217) that the type of Thuillier's *limosus* now in Hb. Delessert at Geneva is a specimen of the above hybrid. Notwithstanding Murbeck's reasoned conclusions, there are a few authors who have continued to treat *palustris* as a hybrid, and it may be as well to remind readers that the plant is absolutely uniformly fertile, in many stations and even counties it occurs in the absence of *maritimus*, it remains constant over long periods in many localities, and it forms hybrids like other true species. This behaviour is in strong contrast to the usual characteristics of hybrid *Rumices*, and moreover a true hybrid between *conglomeratus* and *maritimus* is well known and very different from *palustris*.

It might possible be contended that *palustris* evolved in past ages from a hybrid between the two other species but such a conclusion belongs to the study of phylogeny. To treat it as a hybrid in a systematic account of the genus as has been done by Ascherson & Graebner merely leads to taxonomic complication and confusion. The principle carried to its logical conclusion would lead to the reduction of many of the species in the British Flora to the status of hybrids between the few remaining species. Such a result, by making the identification of plants difficult, would defeat the primary purpose of taxonomy. The writer believes that a plant should only be treated as a hybrid when there is adequate evidence suggesting that it should be so treated.

R. palustris is one of the least variable of British Docks, but certain variations occur to which it will be necessary to give attention in a later paper. The following form, however, may be disposed of here:—

Forma NANUS (Boenninghausen) mihi, comb. nov.; *R. palustris* Smith var. *nanus* Boenninghausen, *Prod. Fl. Monast.*, 108, 1824.

Exsicc. 21, Middlesex; Hendon, Lousley (126a).

Plant simple, less than 10 cm. tall when in fruit.

This form is analogous to *R. maritimus* f. *humilis*, and appears to be a short-lived annual resulting from fruit which germinated late in the season. The only specimens seen are those cited above, which occurred on a stony slope by the Brent Reservoir ("Welsh Harp"), Hendon.

Duration. There is great difference of opinion between various authors as to the duration of this species. Thus, for example, Ascherson & Graebner give it as "annual, rarely biennial," Rouy as "annual or biennial," Syme as "biennial," while in the latest editions of Babington and Hayward's *Botanist's Pocket Book*, as in Smith's original account, it is claimed as a perennial. Duration sometimes varies in different countries according to climate, and it may be that *R. palustris* is annual in Central Europe but tends to persist through the milder winters of western Europe. Observation during the past year suggests that it can probably behave as annual, biennial, or perennial in Britain, its duration varying according to the conditions prevailing in the various localities.

At Hendon abundant seedlings were observed on October 29th, 1938, also masses of fruits cast up in the "scumline" around the pond, and large rosettes of leaves on plants which had not flowered during the previous summer (21, Middlesex; Hendon, Lousley 178, 181, and 194 in Hb. Kew (Ecol.)). The progress of similar barren rosettes had been watched during previous visits, and it seems probable that at this locality seed germinates in autumn and the resulting plants flower sometimes in the first but often not until the second summer. Seed which germinates in the spring may, if the offspring flower at all the first year, produce plants of the form which is described above as *nanus*. Cultivation experiments confirm this conclusion since, although erratic germination was induced in June and July, it was much more free in early September. At the Mitcham locality, where conditions are less open, most of the plants appear to be definitely perennial. A few young plants were found here in August and a fair number of seedlings on November 26th, 1938.

Distribution. Owing to former confusion with *R. maritimus*, it is proposed later to publish details of the material seen from the various vice-counties. At the time of writing specimens have been seen from the following v.-cc.:—5, 6, 14, 15, 16, 17, 18, 21, 25, 27, 28, 29, 31, 32, 61.

The loan of ripe material from elsewhere will be welcomed, and especially from the following v.-cc.:—9, 11, 13, 20, 23, 26, 30, 39, 50, 52, 53, 54, 56, 59, 62, 63, 64, 65, for which the species is on record.

Flowering Date. White (*Fl. Bristol*, 514, 1912) states that on the Somerset peat-moors *R. palustris* flowers a month later than *R. maritimus*. This is not in accordance with the writer's own experience, since ripe *palustris* was collected near Shapwick on July 17th, 1933, growing in close proximity to less mature *R. maritimus*. At Mitcham *R. palustris* was in advanced flower on June 29th, 1938, and ripe fruits might have been gathered a fortnight later, and flowering both at this station and at Hendon continued until the end of November. It appears likely that White was misled by a coincidence that the visits to the peat-moors on which he observed *palustris* were later than those on which he found *maritimus*.

618/13. R. MARITIMUS L., *Sp. Pl.*, 335, 1753.

Icones. *English Botany*, t. 725 (enlarged fruit poor); Butcher & Strudwick, *Further Illustrations*, t. 321, fig. Z, 1930.

Exsicc. 28, W. Norfolk; Ringmere near Thetford, Lousley (138).

Type. Hb. Linn. No. 13 (labelled " 8 maritimus " by Linnaeus).

This species remains extremely uniform throughout a very wide geographical range and the only variations observed in British material are those of luxuriance as indicated by the forms given below. On purely taxonomic grounds these names are not worthy of retention, but since, as will be shown, they appear to have a wider biological significance it is convenient to have names for purposes of reference and to indicate the range of variation.

Forma HUMILIS (Petermann) mihi, comb. nov.; *R. maritimus* L. var. *humilis* Petermann, *Fl. Lips. Exc.*, 267, 1838.

Plant erect, subsimple, less than 10 cm. tall. Leaves few, linear, acute.

Exsicc. 28, W. Norfolk; Ringmere near Thetford, Lousley (138a).

These plants were collected from the sandy margin of a Breckland mere, where this dwarf form has been known to me since 1934 (see also Little in *B.E.C. 1927 Rep.*, 416, 1928). Specimens were gathered in which the whole plant above ground was less than 2 cm. tall but, while the bulk of the population was small, plants as tall as 30 cm. occurred where shelter was afforded by rushes.

Forma RAMOSUS Zapalowicz, *Consp. Fl. Galic. crit.*, *2*, 112, 1908.

Fruiting plants tall (½-1 metre); stem leafy, much branched above; branches elongate, arcuate-ascending forming a dense, broad panicle. Lamina of lower leaves *c.* 35 × 6.5 cm.

Exsicc. 18, S. Essex; Wennington, Lousley (170).

These specimens were collected from plants growing in rich mud on the margin of a somewhat shaded pool. Owing to their top-heavy condition most individuals were sprawling, so that the very exceptional height was not always apparent. On September 3rd, 1938, most plants were only in immature fruit, but ripening was so rapid that a week later much of the fruit was dropping.

Duration. The duration of *R. maritimus*, like that of *R. palustris*, would appear to be little understood, and it has been variously stated as annual, biennial, and perennial. For example, in current editions of British Floras, Syme (*E.B.*), Hooker (*Student's Flora*) and Moss (*Camb. Br. Fl.*) all agree that it is biennial, Druce (*Hayward's Botanist's Pocket-Book*) asserts that it is perennial, while Babington (*Manual*) states that is is perennial or biennial. The following notes on localities where periodical observations were made during 1938 throw some light on the question:—

(a) Ringmere, near Thetford, W. Norfolk. Most careful search was made here on April 22nd for leaves or seedlings at the exact spot which the species was known to favour, without any trace of the Dock being found. Mr E. C. Wallace, who was with me on the occasion of the first search, visited Ringmere again on June 26th and saw no signs of *R. maritimus.* On August 14th the plant was seen in good quantity on the ground formerly searched, being still in the seedling stage close to the margin of the pool, but in flower and fruit at higher levels. At this station I believe the plant to be definitely annual, first germinating in June and early July. Those plants which grow close to the margin of the pool must germinate and fruit in the interval between the fall in the water level and the incidence of autumn frost.

(b) Near Charlston Pond, E. Sussex. No trace was to be found on April 10th, but young leaves were seen on July 9th, and plants were in over-ripe fruit on August 21st. On October 28th the old leaves were ragged and appeared to be decaying, and no trace of marked plants remained on January 8th, 1939. At this station it appears to be annual, but it is not easy to be certain. It may be mentioned here that the fact that, say, a dozen marked plants all die during the winter cannot be regarded as absolute proof that the species at a locality is not behaving as a perennial, since it might happen that the selected plants were all perennials or biennials which had reached the end of their life. At Charlston crowded vegetation made mass observation difficult, at Ringmere and Wennington limited areas were populated almost exclusively by *R. maritimus.*

(c) Wennington, S. Essex. In flower and early fruit September 3rd, and in mature fruit September 10th. On December 18th the old flowering stems had decayed, but there were abundant green fresh leaves which appeared to grow from their base embedded in thick ice. These leaves had not increased in size or decreased in number by March 12th, 1939. At this station *R. maritimus* appears to be perennial, and its late flowering may be due to shaded conditions.

In cultivation the plant behaves as a short-lived annual, as is shown from the following examples:—

1. Seed gathered the previous year was sown at Norwood on February 22nd, 1907, and a fruiting specimen over 40 cm. tall was pressed on August 15th, 1907 (W. H. Griffin in Hb. S.L.B.I.).
2. Seed was sown at Kew in the spring of 1930, and in June the ground was dutch-hoed so that any earlier growth would have been destroyed. On August 26th, 1930, good fruiting specimens were pressed (E. Nelmes in Hb. Kew (Ecol.)).

From the facts given above, and observations in the field elsewhere it appears likely that *R. maritimus* behaves as an annual of brief duration when it grows in an open association, such as on the margins of pools, on mud thrown out from dykes, and in bare places trodden out by cattle on ditch-sides. The extreme annual form is that described as f. *humilis*. The annual condition may enable it to persist in places where the winter climate is too cold for the tender shoots of the perennial form, and therefore it may be more frequently annual in Central than in Western Europe.

The perennial form probably occurs chiefly in more or less sheltered spots in places where the winter climate is not too severe, and as a perennial the plant can exist in almost closed associations in which opportunities for germination are less common. The extreme perennial form is that described as f. *ramosus*.

In cultivation it was found that the fruits of *R. maritimus*, like those of many other *Lapatha*, exhibit delayed or intermittent germination to a very marked degree. About 60 seeds were sown in March 1938, and seedlings appeared at intervals from April 28th until October 1st. Abundant seedlings were observed at Wennington on September 10th, and it is probable that it is only at such sheltered spots, and where they are not liable to long winter submergence under water, that they are able to exist throughout the winter. Thus the perennial (and biennial?) states arise mainly from late seedlings, since many of the earlier ones would be smothered by the extensive growth of the parent plants. In the annual form, on the contrary, it is only the seedlings which germinate early which come to maturity, the later ones dying on the rise of the water level or onset of winter.

Distribution. For the reason given under *R. palustris* it is considered advisable to prepare a new account of the distribution of this species, citing undoubted herbarium material for each vice-county so far as that may be possible. Such material has to date been seen from the following v.-cc.:—5, 6, 9, 12-14, 16-20, 22-24, 27-32, 34, 37-40, 53-56, 59, 61, 62, †66, H.5, H.12, H.22. Jersey.

Specimens in good fruit from other districts will be appreciated on loan, but especially from the following for which the species has been recorded, v.-cc.:—2, 10, 11, 15, 21, 25, 26, 33, 35, 41, 42, 49, 50, 51, 57, 58, 60, 63, 64, 65, 67, 69, 70, H.2, H.8.

Both *R. maritimus* and, to a less marked extent, *R. palustris* are very variable in quantity at many of their stations from year to year. It is proposed to deal with this subject later when more data have been accumulated.

618/20. R. PATIENTIA L., *Sp. Pl.*, 33, 1753.

A tall (100-170 cm.) erect perennial plant. Basal leaves with ovate- or oblong-lanceolate lamina (40-50 cm. × 12-15 cm.), their base truncate or sub-cuneate (rarely sub-cordate), apex acute. Secondary veins making an angle of 45°-60° with the mid-rib. Mature valves roundish-cordate, entire or with a few short denticulations, or crenulate, one bearing a large (2-2.5 mm. × 1-1.25 mm.) tubercle, the other two naked or with minute tubercles.

Exsicc. and *Icones* as under sub-species.

This species has only become established in Britain within recent years, but it is now completely naturalised at a number of stations and must be regarded as a permanent unit in our flora. The abundance of this fine plant as it occurs at the Chiswick and Grays localities must be seen to be believed. On the Middlesex side of the Thames, at Chiswick, it extends over a large piece of waste-ground, by pathsides, on both sides of an adjoining railway embankment, and along the stone river embankment almost continuously for ¾ mile. On the opposite Surrey side of the river it is to be found at intervals from Barnes Bridge (where I first noticed it in 1933) past Mortlake almost to Kew Bridge. All these plants belong to the ssp. *orientalis* (see below) and perhaps arose from a single introduction, but above Kew Bridge there is a small isolated colony of ssp. *eu-Patientia*. In S. Essex, again as ssp. *orientalis*, it occurs in the utmost profusion, forming great thickets on waste-ground by the Thames for ¾ mile between Grays Thurrock and Tilbury. I was directed to this station by Mr Iolo A. Williams, who tells me that he first noticed the plant here about 1933. The Dagenham colony of ssp. *eu-Patientia* was no less remarkable since the Dock occurred at intervals for 1¾ miles. The centre of this colony has been destroyed by the construction of a factory, but the plant still grows at both ends of its range.

R. Patientia has been recorded from a few vice-counties additional to those from which specimens are cited below. As many records as possible have been assigned to the appropriate sub-species but for various reasons this has not proved possible with the following gatherings:—

19. N. Essex; Virley, 1920, G. C. Brown (Ref. 1775), with a note that the plant had been known since 1909 or 1910 (Hb. Druce); Varley

(the same locality), 1921, Druce (Hb. Druce). The species thus persisted here for at least 11 years, but Mr Brown informs me that it has now disappeared (*in litt.*, April 25th 1938).

34, W. Gloucester; Redland, Bristol, 1926, Roper (Hb. Druce).

39, Staffs.; Burton-on-Trent, 1929, Druce (Hb. Druce).

In this country *R. Patientia* has been frequently mis-identified in the past. Material from Hitchin (ssp. *eu-Patientia*) and Virley was first labelled and recorded as *R. longifolius* DC. (*R. domesticus* Hartman), but the presence of tubercles on the valves should have prevented confusion with the grainless northern species, which is a smaller plant with fastigiate panicles. Other specimens have been sent out as *R. Hydrolapathum* and *R. viridis*—quite inexcusable errors. Of the native British species, *R. Patientia* is most closely allied to *R. crispus*, from which it may be distinguished by its much greater size, larger less undulate leaves, and larger (7-8 × 7.5-9 mm. as against 3.5-5 × 3.5-5 mm.) valves.

Rechinger (1933A) has published an exhaustive monograph of the subsection *Patientiae* of *Rumex*, based on considerable field experience of these plants. The herbarium material available in Britain is not sufficient to check fully his distinctions and distribution, and much of the material which follows is adapted from Rechinger's work.

Of *R. Patientia* (*sensu stricto*) he gives three subspecies, two of which occurring in Britain are keyed as follows:—

a. Stem usually purplish or reddish-brown, Valves 5-6 mm. broad, only one bearing a tubercle ... *R. Patientia* ssp. *eu-Patientia*.
b. Stem usually pale, very tall and robust, Valves 8-10 mm. broad, two further tubercles sometimes discernible .... *R. Patientia* ssp. *orientalis*.

These two subspecies are described below:—

Subsp. EU-PATIENTIA Rechinger fil., *Fedde Rep.*, *31*, 246, 1933.

Icones. Beck in Reichb., *Icones*, *24*, t. 164, 1904; Coste, *Fl. France*, *3*, t. 3134. 1906; Rechinger, *op. cit.*, t. cxxxvi, fig. 1.

Exsicc. Kerner, *Fl. Exsicc. Austr.-Hung.*, No. 3072 (Hb. Kew) 17, Surrey; Bank of Thames nr. Kew Bridge, Lousley (13) (*teste* Rechinger).

Basal leaves ovate- or oblong-lanceolate with truncate or sub-cuneate (rarely subcordate) base. Mature valves 6-8 × 5-6(-7) mm., entire or minutely dentate or crenulate, rotund-cordate, only one bearing a globose or oblong tubercle *c.* 1.5 mm. long.

Distribution. An uncommon alien in Britain, persistent at a few stations.

16, W. Kent; Stone Marshes, 1903, Griffin—as *R. sanguineus* var. *viridis* (Sibth.) (Hb. S.L.B.I.); Stone Marshes, 1923, St John Marriott (Hb. Druce). It thus appears to have persisted in this station for at least 20 years.

17, Surrey; Kew Bridge (as above).

18. S. Essex; Dagenham, 1927, Druce (Hb. Druce). Still persisting (see above), and it has therefore been established for at least 11 years.

20. Herts.; Walsworth, Hitchin, 1920, Little (Hb. Druce); Nr. Gas Works, Hitchin, 1927, Little (723), *B.E.C. 1927 Rep.*, 587, 1928 (Hb. Druce, etc.); Nr. Gas Works, Hitchin, 1932, Little (983), *B.E.C. 1932 Rep.*, 449, 1933. It thus persisted here for at least *12 years.

34, W. Gloucester; Cranbrook Rd., Bristol, 1928, White, *B.E.C. 1928 Rep.*, 925, 1929 (Hb. Kew, *teste* Rechinger).

Distribution abroad. Native in Austria, Hungary, Bulgaria, southern Russia to Transcaucasia, Syria and Kurdistan. Formerly cultivated throughout Europe, and now naturalised here and there.

Subsp. ORIENTALIS (Bernhardi) Danser, *Ned. Kruidk. Arch, 1923*, 281, 1924. *R. orientalis* Bernhardi apud Schultes fil., *Syst. Veg.*, 7, 1433-4, 1830.

Icones. Rechinger fil., *Fedde Rep. 31*, t. cxxxvi, fig. 3, 1933. Heukels, *Plantenatlas*, t. xxxvii, 11, 1925.

Exsicc. 22, Middlesex; Chiswick, Lousley (10). 18, S. Essex; Grays, Lousley (27), both *teste* Rechinger.

Basal leaves with oblong-lanceolate lamina (40-50×12-15 cm.) with truncate base. Mature fruiting valves (6-8×8-10 mm.), rotund-cordate, margin usually minutely erose- or crenulate-dentate, rarely almost entire, one valve bearing a prominent ovate, 2-3 mm. long tubercle, the others naked or sometimes bearing small tubercles.

Usually a taller (1-2 metres) more robust plant than ssp. *eu-Patientia*, with pale green stem, more deeply cordate bases to the leaves, and larger breader fruiting-valves.

Distribution. In Britain a very well established alien at the following localities:—

17, Surrey; Bank of Thames near Barnes railway bridge, 1933, Lousley (Hb. Lousley), *teste* Rechinger 1933. 18, S. Essex; 22, Middlesex. —as above.

Distribution abroad. Native in S. Hungary, E. Balkans, S. Russia, and Asia Minor.

Biology. The life history of this Dock is of considerable interest. It is the first to flower of all the *Lapathum* species which occur in Britain, and good fruit may be found by the third week in June. By early July 1938 almost every plant had passed into fruit and the basal leaves had decayed. From the end of July until the end of September the great majority of the plants in the two colonies, which were periodically examined, remained dormant, practically no green leaves being visible, and the stems being dry and crowned with brown fruits. Seedlings were seen at Chiswick at the end of August, and at Grays on September 3rd, 1938—in the garden they germinated at the beginning of September from fruit matured a few weeks earlier. In October fresh green leaves appeared in the wild stations on the plants which had flowered earlier in the season, and these remained apparently active throughout the winter. Although these observations were made on colonies of ssp. *orientalis*, it is probable that they apply equally to ssp. *eu-Patientia* in Britain. It appears, therefore, that the species is adapted to withstand a greater summer drought than is usual in this country, but not to endure severe winter conditions. From the distribution given it will be observed that the countries where the species is native do enjoy considerable summer heat combined with a low rainfall, but the winter climatic conditions are more extreme than one would expect from the behaviour of the plant.

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*This still persists in the gardens of recently erected houses near the Gas Works, Walsworth, Hitchin: thus giving a known history at this station of 19 years. —J. E. L., April 30th, 1939.

618/20(2). R. GRAECUS Boissier & Heldreich in Boissier, *Diagn.*, *Ser. 2*, fasc. 4, 80, 1859; *R. orientalis* var. *graecus* Boissier, *Fl. Orient.*, *4*, 1009, 1879.

Icones. Rechinger fil., *Fedde Rep.*, *31*, t. cxxxvi, fig. 7, 1933.

Exsicc. 41, Glamorgan; roadside east of Cardiff, Lousley (177), *teste* Rechinger.

A woody perennial closely allied to *R. Patientia* L. Stem erect, 60-200 cm. tall. Basal leaves with ovate-lanceolate or ovate-oblong lamina (20-30 × 10-15 cm.) with cordate base and acute apex. Secondary leaf-nerves making an angle of 60°-70° with the mid-rib. Valves of fruit (6-8 × 6-7 mm.) cordate, with frequent and acute but irregular teeth on both sides, these teeth at most 1 mm. long. Valves usually all tubercled, one bearing a large (2-3 mm. long) globose or ovate-globose tubercle, the other two tubercles often small and sometimes absent.

Distribution. Alien in Britain, appearing to be well established near Cardiff.

41, Glamorgan; as above.

Distribution abroad. Native in S. Balkans, W. Asia Minor and Cyprus.

[618/28. R. GIGANTEUS Aiton, *Hort. Kew.* ed. 2, *2*, 323, 1811; Hillebrand, *Fl. Hawaiian Islands*, 377, 1888.

The inclusion of this species in Druce's *British Plant List*, ed. 2, 1928, is apparently based solely on plants collected by Dr Druce at Marston, near Oxford. The plant first found here by him in 1918 (*B.E.C. 1918 Rep.*, 307 (1919)) was said to have originated from the Oxford Botanic Gardens, and Mr Chapple informs me that it persisted until about 1930. In Hb. Druce it is represented by three sheets bearing leaves and parts of a panicle in bud dated 1918, and two undated sheets, one of which shows ripe fruit. These specimens show quite clearly that the Marston plant has nothing whatever to do with *R. giganteus*, of which the type specimen is in Hb. Mus. Brit. Aiton's species is a very remarkable Dock with a climbing habit which enables it to ascend to a height of 40 feet in the forests of the Sandwich Isles, where it occurs as a native, and the axillary panicles are quite unlike those of any European species of *Rumex*. Druce apparently visited Marston to see the plant at intervals over a period of about twelve years, and yet it seems that he had no suspicions as to the accuracy of the determination, for he repeated his original record in *Fl. Oxon.*, ed. 2, 369, 1927.

R. giganteus Aiton must be deleted from the *British Plant List* and, if it is considered worth while to include a plant known only as an outcast from a Botanic Garden, which failed to spread from or persist in its single station, the following should be substituted:—]

618/28 (substituted). R. CONFERTUS Willdenow, *Enum. Plant. Hort. Reg. Bot. Berol.*, 397, 1809; *R. alpinus* var. *subcalligerus* Boissier, *Fl. Orient.*, *4*, 1007, 1879.

Icones. Beck in Reichb., *Icones*, *24*, t. 159, 1904.

Exsicc. Kerner, *Fl. Exsicc. Austro-Hungarica*, No. 3074 (Hb. Kew).

A tall (? 1-2 metres) coarse plant allied to *R. alpinus*. Basal leaves (20-27 × 15-24 cm.) broad cordate-ovate, obtuse, broadest near their base, hairy below when young. Stem leaves narrower, usually somewhat triangular in outline. Panicle large, dense. Valves large (*c.* 8 × 11 mm.), roundish-cordate, broader than long, entire or with a few small obtuse teeth or crenulate, at least one bearing a tubercle.

As is well shown by a leaf of the Marston plant gathered in July, 1918, in Hb. Druce, the basal leaves of *R. confertus* bear considerable resemblance to those of *R. alpinus* but are slightly less rotund and obtuse. The stem leaves, however, might lead to confusion with *R. Patientia*, from which they may be known by their more deeply cordate bases and presence of short hairs on the nerves below when young. The much broader and larger valves should likewise prevent confusion of *R. confertus* with *Patientia*.

Distribution. 23, Oxford; Marston Brickfields, Druce as *R. giganteus* Aiton (Hb. Druce)—the only recorded station for Britain. Native from Siberia through Mid and S. Russia to the Caucasus, Crimea and Galicia.

618/31. R. STENOPHYLLUS Ledebour, *Fl. Altaica*, *2*, 58, 1830; *R. biformis* (Menyhárth) Borbas in Kerner, *Fl. exs. Austr.-Hung.*, 1883, *Schedae 3*, 130, No. 1014, 1884; *R. odontocarpus* Sandor apud Borbas, *OBZ.*, *37*, 334, 1887. The two descriptions of Borbas are based on earlier references of 1877 and 1879 respectively in Magyar publications which I have not been able to verify.

Icones. Ledebour, *Icones Plant.*, *cent. 4*, t. 399, 1833 (but see below); Beck in Reichb., *Icones*, *14*, t. 182, 1904; Heukels, *Plantenatlas*, ed. 2, fig. xxxvii. 17, 1925.

Exsicc. Kerner, *Fl. exs. Austr.-Hung.*, No. 1014, as *R. biformis* Menyhárth (Hb. Kew).
34, W. Gloucester; Avonmouth Docks, Lousley (159).

Stem 100-150 cm. tall. Lower leaves oblong, often truncate at the base, apex rather obtuse, margin undulate; the upper leaves lanceolate. Panicle dense with ascending branches and usually leafy below. Valves light green in early fruit becoming reddish-brown when mature, rather small (4-5 × 4-5 mm.), rotund with a short triangular apex, with 4 to 6 short (< .5 mm.) broad-based teeth on each side; all bearing small oblong tubercles near the base.

Ledebour described and illustrated a plant with linear leaves which is superficially very different in appearance from the form familiar to most European botanists, though the fruit would appear to be identical. The vegetative difference may well be due to differences in habitat conditions, and I have, therefore, followed Rechinger in accepting Ledebour's name for the species. A useful note on this plant by Rechinger pater will be found in *OBZ.*, *41*, 402, 1891.

R. stenophyllus recalls *R. crispus* in the shape of the leaves, but the undulate rather than crisped margins, and the presence of rather pretty serrations on the valves should prevent confusion. The rather dense panicle somewhat suggests that of *R. domesticus* though it is less fastigiate and less leafy than in that species, and the presence of tubercles on the serrate valves offers a ready mark of distinction. Abroad *R. stenophyllus* has been most often confused with *R. crispus* × *obtusifolius* (sub nom. *R. pratensis*); from this hybrid it may be known by the uniform fertility, and more regular serrations on the rotund valves.

Distribution. In Britain only known with certainty from Avonmouth Docks, where it seemed well established in August 1938. Native from Central Asia and Siberia to S. Russia, Austria and Hungary.

It is quite probable that now attention has been directed to this plant it will be found elsewhere as an alien in Britain, especially as it appears to be a comparatively common adventive in Holland. There is a flowering plant in Hb. Druce from Sharpness Docks, W. Gloucester, which, although too young to name with certainty, might well be this species. A likely explanation of the puzzling record of *R. domesticus* × *obtusifolius* found in 1908 at Portishead Docks (*B.E.C. 1932 Rep.*, 357 (1933)) may be that *R. stenophyllus* was the plant actually found.

HYBRIDS.

Hybrids occur in the *Lapathum* section of *Rumex* with exceptional frequency. In the *Acetosae*, on the contrary, they are exceedingly rare, if indeed they occur at all. A partial explanation of this very striking contrast may be found in the fact that dichogamy is the rule with the *Lapatha*, while the common species of *Acetosae* are apogamous (Roth, *Bonn. Verh. nathist. Ver. 1906*, 327-360, 1907).

Fortunately, it is possible to recognise almost all Dock hybrids as such at sight owing to the prevalence of partial sterility. Normal uncrossed *Rumices* pass regularly out of flower from the base to the summit of the panicle, so that when the lower whorls are passing into fruit those at the top of the panicle are still in flower. Eventually all whorls regularly set fruit. Hybrids as a rule behave very differently. The great majority of the flowers fail to set fruit at all, and dry off and fall without any appreciable enlargement of the three inner perianth-segments. A few here and there are usually fertile and set fruit, the inner perianth segments enlarging in varying degrees. Thus the panicle acquires a ragged irregular appearance, and in most of the whorls will be found (1) stumps of the peduncles where flowers have dropped off, (2) shrivelled remains of perianths which have failed to develop, (3) partially enlarged perianth segments, and occasionally (4) matured valves contamly apparently good fruit. Often such hybrids are conspicuously flushed with red.

The partial sterility of *Lapathum* hybrids is also usually revealed by the pollen-grains, and the value of this test, which often proves extremely convincing, was first demonstrated for *Rumices* by Murbeck (1913: 206). If pollen from a pure species is examined under the microscope practically all the grains will be found to be of the same size, and at the most 5% of them noticeably smaller than the others and abortive. Pollen taken from hybrid plants generally reveals grains of various sizes, a considerable proportion being very much smaller than the remainder and abortive. The test is most easily applied to fresh material, but it can also be utilised for herbarium specimens. Gum Chloral Mountant has been used to make permanent mounts of the pollen grains of a few plants, and if these prove successful it may be possible to make greater use of the test.

It is clear that the most representative hybrid Docks often make very poor herbarium specimens owing to their ragged appearance. This has led many collectors in the past to ignore them in the field, with the result that they are not nearly so well represented in our public herbaria as one would expect from their frequency.

Although these general rules for the recognition of hybrids from their partial sterility are nearly always true, there is good reason to believe that this may not be universally so. A few undoubted hybrids may occasionally produce quite a high production of well formed nuts—this, for example, is sometimes the case with *R. crispus* × *obtusifolius*. In addition, plants are known which have intermediate characters between two species, and yet bear uniform fully formed fruits. Such intermediates have been seen in Britain between *crispus* and *domesticus*, *Patientia*, and *rupestris*, and also between *obtusifolius* and *pulcher*. Thus it is probable that in *Rumex* fully fertile hybrids may rarely occur in spite of the fact that in two of the above combinations other intermediates conspicuous for the predominance of sterility have been noted.

Many hybrids in the genus take on a fairly regular form capable of taxonomic description, and indeed several of these have proved sufficiently uniform to pass for a time as species (e.g. *R. maximus* auct.

angl. = *R. Hydrolapathum* × *obtusifolius*, and *R. pratensis* Mert. & Koch = *R. crispus* × *obtusifolius*). Secondary hybrids doubtless occur as a little viable fruit is usually produced by the primary hybrids. But such secondary crosses are probably comparatively rare since (1) the writer has been unable to find in any locality a series of intermediates conecting two parents, and (2) if secondary hybrids were more common the difficulties in the way of framing descriptions would be even greater than they are.

Further evidence is required before the existence of triple hybrids in the genus can be accepted (*cf.* Fritsch: 1918), those recorded in the past having been based either on doubtful determinations or arising through a plant which is now regarded as a good species being considered as a hybrid. As an example of the last class *R. palustris* (see *ante*) is treated by Ascherson and Graebner as *R. conglomeratus* × *maritimus*, and if we accepted this view *R. obtusifolius* × *palustris* would become *R. conglomeratus* × *maritimus* × *obtusifolius*. Since no such "hybrid-species" are accepted for the genus by the writer, it may be stated that triple hybrids are unknown amongst the British *Rumices*.

It is anticipated that full accounts of all *Rumex* hybrids accepted for Britain will eventually appear in these Notes. Since the next instalment will probably be entirely taken up with the discussion of some of the remaining species, it seems advisable to include here a list of hybrids distributed in *Rumices Britannicae Exsiccatae* in 1938 as a guide to their relative frequency and a stimulus to the collection of additional material. The reference numbers are those under which they have been issued in the above set of Exsiccata, and the addition of "Rech." indicates that Dr Rechinger fil. has agreed to the identification of a sheet of the gathering which is retained in his herbarium in Vienna.

[Those hybrids printed in heavy black type are additions to *Br. Pl. List*, ed. 2.—Ed.].

R. HYDROLAPATHUM Huds.

× *obtusifolius* L. 26, W. Suffolk; West Stow, 139 (Rech.).

× *obtusifolius* L. ssp. *agrestis* (Fries) Danser. 14, E. Sussex; Landport, Lewes, 146 (Rech.). 22, Berks.; Sandford Mill, Loddon, 167 (Rech.).

R. DOMESTICUS Hartm.

× *obtusifolius* L. 104, Skye; Broadford, 85 (Rech.) and 86.

× **obtusifolius** L. ssp. **agrestis** (Fries) Danser. 66, Durham; near Middleton-in-Teesdale, 102 (Rech.). 85, Kinross; Loch Leven, 99 (Rech.).

R. CRISPUS L.

× *domesticus* Hartm. 81, Berwickshire; Quarry near Burnmouth, 78. 85, Kinross; Crook of Devon, 97 (Rech.). 104, Skye; Broadford, 86a.

× *obtusifolius* L. 17, Surrey; Thames' Bank, Mortlake, 45 (Rech.).

× **obtusifolius** L. ssp. **agrestis** (Fries) Danser. 14, E. Sussex; Alfriston, 33 (Rech.). 17, Surrey; Thames' Bank, Mortlake, 43 (Rech.) and 49 (Rech.); Mitcham Junction, 26 (Rech.) and 169 (Rech.). 21, Middlesex; Chiswick, 42 (Rech.). 29, Cambs.; Engine Drain, Ely, 137; near Sutton Gault, 135 (Rech.). 88, Mid-Perth; banks of Tay below Perth, 94 (Rech.). 90, Angus; roadside, Rescobie, 92 (Rech.).

× **Patientia** L. ssp. **orientalis** (Bernh.) Danser. 18, S. Essex; Grays, 28 (Rech.).

× **pulcher** L. ssp. **eu-pulcher** Rech. fil. 17, Surrey; Shalford Common, 189.

R. OBTUSIFOLIUS L. ssp. AGRESTIS (Fries) Danser.

× **palustris** Sm. 17, Surrey; Mitcham Junction, 54. 21, Middlesex; Hendon, 127 (Rech.).

× **Patientia** L. ssp. **orientalis** (Bernh.) Danser. 17, Surrey; Thames' Bank, Mortlake, 47 (Rech.). 21, Middlesex; Chiswick, 38 (Rech.).

R. CONGLOMERATUS Murray.

× *crispus* L. 17, Surrey; Littleworth Common, 70 (Rech.). 29, Cambs.; near Earith Bridge, 131 (Rech.). 34, W. Gloucester; Avonmouth, 161 (Rech.).

× **Hydrolapathum** Huds. 14, E. Sussex; Alfriston, 149 (Rech.).

× *maritimus* L. 13, W. Sussex; Patching Great Pond, 186. 18, S. Essex; Wennington, 171 (Rech.). 23, Oxon.; Binsey Common, 150 (Rech.), 151, and 152 (Rech.).

× *obtusifolius* L. 13, W. Sussex; near Houghton Bridge, 32.

× **obtusifolius** L. ssp. **agrestis** (Fries) Danser. 14, E. Sussex; Alfriston, 148 (Rech.). 17, Surrey; Godalming, 64 (Rech.); Thames' Bank, Mortlake, 48 (Rech.).

× **pulcher** L. ssp. **eu-pulcher** Rech. fil. 17, Surrey; Littleworth Common, 67 (Rech.); Shalford Common, 59 (Rech.) and 60 (Rech.). 35, Monmouth; Castle Dell, Chepstow, 154 (Rech.).

R. MARITIMUS L.

× **obtusifolius** L. ssp. **agrestis** (Fries) Danser. 29, Cambs.; Roswell Pits, Ely, 134 (Rech.).

The notes included in this paper cover less than a third of the material accumulated to date, and serve to give some indication of the interesting problems encountered in the group, and the amount of work still necessary before our knowledge of the British *Rumices* may be considered at all exhaustive. The study of Docks in this country has been seriously neglected since the time of Trimen, Warren and Syme, and the knowledge of British plants has not kept pace with the advances made abroad by Beck, Murbeck, Danser and Rechinger. These remarks apply not only to our native *Rumices*, but also to the long list of recorded aliens, in which very many alterations will be necessary. In order to make the present revision as complete as possible it is hoped that botanists will co-operate by forwarding fresh material of interesting plants during the summer months, and dried material from their herbaria for examination during the winter. In general, all mature specimens of the following will be especially useful:—

1. All species from Scotland gathered in August or later.
2. Any plants known to be adventive.
3. Plants from vice-counties from which it is stated in these notes that no material has been seen.

Communications should be addressed to the writer at 7 Penistone Road, Streatham Common, S.W.16.

Finally, I wish to acknowledge my great indebtedness to Dr Karl Rechinger, jun., of Vienna, for his assistance with the identification of specimens and for his help so very freely given in many other ways, to Dr Danser for a complete list of his publications, to the custodians of the herbaria listed below for facilities for studying the material in their charge, to Dr W. B. Turrill for advice and references, to Mr E. Nelmes for notes on *R. maritimus*, and to Messrs A. J. Wilmott and J. F. G. Chapple for assistance in various ways. Appreciation is also due to Dr R. C. L. Burges, Mr E. C. Wallace, and other companions on my "Dock-hunts" for their patience at times when my studies may have appeared rather protracted, and to Mr P. M. Hall for editorial help in preparing this paper for the press.

HERBARIA CONSULTED.

[In order to facilitate reference separate abbreviations have been used for herbaria kept apart from the general collections].

Hb. Borrer.	Royal Botanic Gardens, Kew—separate collection of Wm. Borrer (1781-1862).
Hb. Corstorphine.	Private collection of R. & M. Corstorphine, Arbroath.
Hb. Druce.	University of Oxford, Dept. of Botany—separate collection of G. C. Druce (1850-1932).
Hb. Hanbury.	British Museum (Natural History)—separate collection of F. J. Hanbury (1851-1938).
Hb. Hayward.	Private collection of Miss Ida M. Hayward, Galashiels—alien *Rumices* sent on loan to the writer.
Hb. Kew.	Royal Botanic Gardens, Kew. The separate Ecological and Genetical collections are distinguished by the addition of "(Ecol.)" and "(Gen.)" respectively.
Hb. Linn.	Linnean Society of London, Burlington House—the herbarium of C. von Linné (1707-1778).

Hb. Linn. Soc.	Linnean Society of London, Burlington House — a collection of British plants acquired from various botanists during the early history of the Society.
Hb. London.	London Natural History Society — a collection of British plants from various sources maintained at the headquarters of the Society.
Hb. Mus. Brit.	British Museum (Natural History). This reference includes material in the British and European (including Standard and General) Herbaria.
Hb. S.L.B.I.	South London Botanical Institute, 323 Norwood Road, S.E.24.
Hb. Smith.	Linnean Society of London, Burlington House—the collection of Sir J. E. Smith (1759-1828).
Hb. Syme.	British Museum (Natural History) — the separate collection of J. T. I. Boswell-Syme (1822-1888).
Hb. Wales.	National Museum of Wales, Cardiff.
Hb. Wallace.	Private collection of E. C. Wallace, Sutton.
Hb. Watson.	Royal Botanic Gardens, Kew—separate collection of H. C. Watson (1804-1881).

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ABSTRACTS FROM LITERATURE.

Compiled by the Hon. Editor with the collaboration of the following helpers:—Mr R. A. Blakelock, Mr A. A. Bullock, Mr A. K. Jackson, Dr R. Melville, and Mr A. E. Wade.

GENERAL.

(A) MORPHOLOGY.

LEAF PETIOLES.—The comparative anatomy of leaf petioles can be used, according to Dehay (1938), as a basis for general lines of classification in the same way as wood anatomy has been used by Burtt Davy and Chalk. Excellent characters are furnished indicating the affinity of the Euphorbiales with the Morales and also with the Malvales by way of the Sterculiaceae.

EPIDERMIS.—The epidermal characters in some species of *Verbascum*, *Rhododendron* and *Sedum* are shown to be as specific as internal structure or floral morphology.—Lavier-George (1937).

(B) GENETICS.

FRAGRANCE.—The inheritance of fragrance is analysed by McLean (1938).

(C) BIOLOGY.

GROWTH AND TRANSPIRATION.—The effect of artificial wind on growth and transpiration in the case of *Setaria italica* is described by Rao (1938).

SEED DISPERSAL.—A general illustrated account of seed dispersal mechanisms is given by Molinier and Muller (1938), with an analysis of the part played by plants possessing different types of dispersal mechanism in various plant communities; a bibliography with 97 titles is included.

(D) ECOLOGY.

TRANSPLANT EXPERIMENTS.—The results of periodic records of the six species now in position on the various soils for the years 1936 and 1937 are embodied in the Fifth Report of the British Ecological Society's Transplant Experiments at Potterne by Marsden-Jones and Turrill (1938 C). A summary of the results for the ten years 1928-37 is given in a separate report.

AQUATIC PLANTS.—The distribution of aquatic plants in the English Lakes with particular regard to the physical and chemical characters of the substratum has been studied by Misra (1938).

BRECKLAND.—The origin and development of a Festuco-Agrostidetum is described by Watt (1938) from an area of infertile sand in the south-west corner of Lakenham Warren.

PASTURE-LAND: *Treading*.—Davies (1938) finds that *Lolium perenne*, *Trifolium repens* and *Poa annua* are the most abundant species of heavily trodden verges and pathways in Britain. Under conditions of lower soil fertility the most abundant species are *Agrostis tenuis*, *Poa annua* and the fine-leaved Fescues.

Bates (1938) concludes that the cryptophytic life-forms of the dominant footpath plants, *Poa pratensis*, *Lolium perenne* and *Trifolium repens*, are an important factor in their resistance to treading.

SALT-MARSHES.—Chapman (1938) concludes that Norfolk marshes can be divided into upper and lower sections each exhibiting different conditions of submergence and exposure and gives a table showing the distribution of plant species in relation to these sections. The influence of the tides on the water-table is also discussed.

EFFECT OF SALT SPRAY.—It is shown that repressed sloping forms of seaside shrubs ("wind forms" of the literature) are not due directly to wind but to the killing action of salt spray on the young growing shoots. It is suggested that the dominants of the ocean dune community are dominant because of their resistance to salt spray.—Wells and Shunk (1938).

ROOTING SYSTEMS: *Heath Plants.*—The results of some observations on the rooting systems of various heath plants on a stretch of Upland Heath in Somerset are given by Heath and Lucknill (1938). They conclude that the peat habitat favours the replacement of a main tap-root and laterals by an adventitious system developed on an elongated rhizome.

Soil-binding Grasses.—A quantitative study of the roots and root-hairs of Oats, Winter Rye and Kentucky Blue-grass was made. Oats would expose a surface of 15 square inches per cubic inch of soil, Rye 30, and Blue-grass about 65 square inches. There would be 150,000 root hairs per cubic inch of soil in the case of oats, 300,000 for Rye and about 1,000,000 for Bluegrass. The last is therefore the most valuable as a soil binder.—Dittmer (1938).

THE CALCICOLE HABIT.—The results of a comparison of the flora of an area of calcareous sand on the Lower Greensand in Surrey with that of an area of typical acid greensand soil and an area of chalk grassland are given by Simpson (1938): he concludes that the factors determining the calcicole habit are chemical.

INVESTIGATION OF SOIL-CHANGES.—An investigation of the changes in soils produced by the breakdown of organic matter and a simple technique for investigating these changes by measuring the electrical potential of soils is explained by Pearsall (1938). This technique is used in the examination of various soils upon which characteristic plant communities occur in the north of England.

(E) MISCELLANEOUS.

USE OF INFRA-RED PHOTOGRAPHY.—An infra-red photograph of a wide landscape in Arctic Lapland taken by Southern and Lewis (1938) shows the main vegetation area. Ecologists might use this method for making rough surveys in a short time.

(F) NOMENCLATURE.

HAWORTH'S "SUPPLEMENTUM PLANTARUM SUCCULENTARUM."—The date of publication of this work, in which many new species were described, has been established by Stearn (1938: 114) as May, 1819.

NYMAN'S "CONSPECTUS FLORAE EUROPAEAE."—This work was published in 4 parts between 1878 and 1892 with two supplements dated by Nyman "1883-4" and "1889-1890" respectively as well as an unofficial supplement by Ernst Roth dated "1886" on the title page (preface "Nov. 1885"). The dates of the four original parts and of the three supplements have now been established by Stearn (1938: 113-114).

VENTENAT'S "CHOIX DE PLANTES."—The dates of ten parts, each containing six plates, issued between 1803 and 1808 are tabulated by Excell (1938).

(G) TAXONOMY.

"ALPHA" AND "OMEGA" TAXONOMY.—The development of present-day or "alpha" taxonomy, based entirely or essentially on morphology, in the direction of a perfect or "omega" taxonomy, in which organisms will be described and classified not only in terms of morphology as at present but also in terms of other branches of biology such as cytology, ecology, and so on, is recommended by Turrill (1938). To attain this object it is suggested that, while the fundamental principles of "alpha" taxonomy should be retained, subsidiary classifications based on a very limited number of attributes should be used in all cases where they are likely to be useful for a special purpose, and experiments should be continually made in incorporating new kinds of data in taxonomy.

TYPE-SPECIMENS.—The establishment of a central repository for type-specimens is urged by Fosberg (1938). Such an institution is desirable in view of the existence or threat of war in many parts of the world and should be established in some place likely to remain peaceful and at the same time enjoying a temperate climate, such as a sparsely inhabited area in the southern Rocky Mountains: it would ultimately be expanded to house a working reference collection and library, with a self-supporting photostating service.

(H) PHYTOGEOGRAPHY.

E. CANADA.—The dynamic nature of floras is strongly stressed by Marie-Victorin (1938) in a study of the phytogeographical problems of Eastern Canada. Numerous species native in the British Isles are mentioned and, since ecological relationships vary somewhat between the two continents, the paper is of distinct interest to British botanists from this point of view.

(I) TOPOGRAPHY.

BRITISH ISLES: CORNWALL.—Observations on Cornish forms in some critical groups (*Viola*, *Veronica*, *Thymus*, *Ulmus*, *Orchis* and *Agrostis*) are made by Rilstone (1938 A).

NORFOLK.—The ecology of Norfolk salt marshes is studied by Chapman (1938).

CHESHIRE AND LANCASHIRE: *Liverpool District*.—An account is given by Stansfield (1938) of plants of the Liverpool district in the herbarium of John Shepherd (1764-1836). The list includes ten species not mentioned by T. B. Hall, *Flora of Liverpool*, 1839. Seven species, which are new records for v.-c. 59, are enumerated in "Plant Records" below. The identifications have been checked at Kew.

The Herbarium of Thomas Velley (1748-1806) like that of John Shepherd is now housed in the Botanical Department, Free Public Museums, Liverpool. Velley's specimens were beautifully prepared by ironing and are still in a good state of preservation. The herbarium is especially rich in Marine Algae but also contains a general collection of British Phanerogams: unlike Shepherd's these were not collected in the Liverpool district but this note is placed here for convenience as the two collections are now housed together.—Blackler (1938).

YORKSHIRE: *East Riding*.—The adventive plants of the East Riding, including all those previously published by J. Fraser Robinson in the *Flora of the East Riding of Yorkshire* as well as many recent records, are listed by Wilson (1938). New records and additions to *Comital Flora* are enumerated below in "Plant Records."

Craven in Wharfedale.—The posthumous publication in the *North Western Naturalist* of the account by the late F. A. Lees of the vegetation of this district is continued in four instalments covering Compositae (*Arctium*) to Filices (*Pteris*).—Lees (1938).

ENGLISH LAKES.—The distribution of aquatic plants with particular regard to the physical and chemical characters of the substratum has been studied by Misra (1938).

SCOTTISH ISLANDS.—The Roses of Bute (100); Mull, Tiree and Coll (103); North Ebudes (104); Handa (108); and Outer Hebrides (110) are described by Harrison and Bolton (1938).

OUTER HEBRIDES.—A total of 206 species of flowering plants and ferns is listed by Clark (1938) from Mingulay and Berneray (Barra Head), the southernmost of the group known as the Barra Isles. Mingulay is approximately 3 miles long by 1½ miles wide, rising to a greatest height above sea-level of 891 feet at Carnan, while Berneray is only 2 miles long by ¾ of a mile wide, with a greatest height of 628 feet. The geological formation is almost entirely gneiss, and the islands therefore consist for the most part of bare moorland. Of the total of 206 species 83 were restricted to Mingulay and 9 to Berneray. None of the species found were new to v.-c. 110, but some of the absentees are of interest. *Vaccinium Myrtillus*, *Empetrum nigrum* and *Myrica Gale* are entirely absent, while *Calluna vulgaris* is very scarce, especially on Mingulay.

An ecological survey of the Isle of Pabbay and other islands in the Sound of Harris with special reference to mammals and the evidence of former woodland was made by Elton (1938). The submerged forest described by Martin in 1703 was found to consist of *Betula alba* and remains of *Corylus Avellana* were found under peat in the centre of Pabbay. There is much evidence of submerged woodland in the Harris Sound region and of the survival into historical times of Birch and Hazel woods on the mainland of Lewis.

SYSTEMATIC.

25/1. Chelidonium majus L. The development of the embryo is described by Souèges (1936 A).

87/1. Helianthemum guttatum (L.) Mill. The development of the embryo is described by Souèges (1937 C).

88. Viola L. Notes on some Cornish plants in the Nomimium Section are made by Rilstone (1938 A: 135).

96/1. Silene maritima With. Two plants of *S. maritima* were crossed together. The seed-parent had much anthocyanin in all parts, except the stigmata, while the pollen-parent was devoid of anthocyanin in all parts. The F_1 plants uniformly showed much anthocyanin in all parts, except for segregation in the stigmata. The F_2 families showed segregation for colour in all organs. Complementary and inhibiting genes are both found to be involved in the presence and absence of colour. One set of genes is probably basically responsible for development of anthocyanin wherever it occurs in the plant. The genetic inheritance of habit, leaf-shape, calyx-shape, overlapping of petals and segments, sex, fruit-shape and sculpturing of testa is also considered.—Marsden-Jones and Turrill (1938 A).

96/9. Silene Otites (L.) Wibel. Kleopov (1936) gives an analytical study of the group *Silene Otites* and recognizes 16 elementary species, 6 of which are new.

124/1. Radiola linoides Roth. The embryo of *Radiola linoides* may be considered typical of the *Linaceae*.—Souèges (1937 B).

An illustrated account of the anatomy of the testa is given by Crété (1937); the presence of thick walled cells and absence of mucilage cells distinguish it from *Linum*.

132. Oxalis L. After the rupture of the capsule the seeds are shot out in rapid succession by the explosive rupture of their outer integuments; the histology of the seed coats (illustrated) is investigated and explanatory theories discussed by Sougy (1938).

153/3. Medicago sativa L. The cause of self-incompatibility is investigated by Brink and Cooper (1938).

178. Lathyrus L. Chromosome number determinations on 35 species indicate that all are diploid ($n = 7$, $2n = 14$) with the exception of *L. venosus* Muhl., which is tetraploid ($n = 14$, $2n = 28$). Attempts to produce interspecific hybrids proved to be abortive. The section *Clymenum* DC. is sharply defined cytologically as well as morphologically.—Senn (1938).

181/1. Phaseolus vulgaris L. Starch grains originate in the vacuole-like central region of young plastids, and grow outwards. —Young (1938).

185. Rubus L. Riddelsdell (1937) gives the distribution of *Rubi* in Gloucestershire.

194/5. Rosa stylosa Desv. See note by Boulenger (1937) on the use of this name.

199. SAXIFRAGA L. Further experimental studies have been carried out by Marsden-Jones and Turrill (1938 B) in connection with interspecific *Saxifraga* hybrids. By employing three species, *S. granulata* L. (Sect. *Nephrophyllum*), *S. hypnoides* L. (Sect. *Dactyloides*), and *S. tridactylites* (Sect. *Tridactylites*), it is shown that hybridization can occur between species belonging to different taxonomic sections of the genus.

211. SEDUM L. Lavier-George (1937) shows that in some species epidermal characters are as specific as internal structure or floral morphology.

213. DROSERA L. The capture of a Meadow Brown Butterfly by *D. rotundifolia* and *D. longifolia* growing together at Ashcott, Somerset, is recorded by Thompson (1938).

225/1. CIRCAEA LUTETIANA L. The flowers are pollinated by small *Apidae* and by *Syrphidae*, not by Hover-flies: it is doubtful whether there are any flowers specially adapted for pollination by Hover-flies.—Kugler (1938).

275/1. ARCHANGELICA OFFICINALIS Hoffm. An account of British occurrences, particularly in the Liverpool District, is given by Dallman (1938 B).

284/1. HEDERA HELIX L. For ecological anatomy see Makarova (1936).

370/4. CHRYSANTHEMUM LEUCANTHEMUM L. A biometrical study of the capitulum is made by Guffroy (1938).

423. TARAXACUM Zinn. The Estonian Taraxaca are dealt with by Marklund (1938).

435/8. CAMPANULA PATULA L. The development of the embryo is discussed by Souèges (1936 B).

438. VACCINIUM L. Farenden (1938) deals with the distribution and fruits of the British species.

438/2. VACCINIUM MYRTILLUS L. The food value of Blaeberry for grouse and sheep is discussed by Thomas (1938). It appears that the plant has substantial feeding value and where occurring in quantity bulks largely in the diet of both grouse and sheep.

440/1. ARBUTUS UNEDO L. A tree at Killarney measuring 9½ feet in girth is mentioned by Nicholson (1938).

460/2. PRIMULA VULGARIS Huds. A short general account of the Primrose is given by Pervival (1938 A).

59. Gentianaceae. The validity of Menyanthaceae as distinct from Gentianaceae is supported by the comparative anatomy of the two groups.—Lindsey (1938).

481/1. MENYANTHES TRIFOLIATA L. With the phyllotaxy of *Menyanthes trifoliata* L. as an illustration, it is considered that arithmetical and geometrical calculations in phyllotaxy have only a relative value owing to the influence of extrinsic factors. The sparse-ternate and partial or total symphyllous arrangements are derived from the opposite-decussate, which is fundamental in both the Dicotyledons and the Monocotyledons.—Ponzo (1937).

509/2. Echium plantagineum L. The development of the flower in relation to pollination is described by Camu (1937). The flowers are protandrous.

511/1. Calystegia sepium R. Br. An account of the behaviour of the nucleole in somatic cell-division is given by Percy (1936).

515. Cuscuta L. The cytology of the genus is discussed by Fogelberg (1938).

527. Verbascum L. Lavier-George (1937) shows that in some species epidermal characters are as specific as internal structure or floral morphology.

532/26. Linaria Cymbalaria (L.) Mill. An illustrated account of the histology at all stages of development of the curiously ribbed seeds is given by Humbert (1938).

543. Veronica L. Notes on Cornish forms are made by Rilstone (1938 A: 135).

543/4. Veronica Chamaedrys L. The flowers are pollinated by small *Apidae* and by *Syrphidae*, not by Hover-flies: it is doubtful whether there are any flowers specially adapted for pollination by Hover-flies.—Kugler (1938).

553. Pinguicula L. The British species vary in the state in which they pass the winter. In *P. vulgaris* and *P. grandiflora* a winter-bud is formed in the heart of the rosette, the leaves of the rosette decay and the winter-bud is left unattached until in the spring a new rosette and roots are formed. In *P. grandiflora* two winter-buds are sometimes formed and also " it may produce rows of tiny budlets along the line of insertion of the inner leaves of the old rosette." In *P. lusitanica* no winter-bud appears to be formed and the rosette-leaves survive the winter.—Blackburn (1938 B).

561. Thymus L. Notes on Cornish forms are made by Rilstone (1938 A: 135).

581/2. Lamium maculatum L. Abnormalities in the flowers are described and figured by Nobécourt (1937).

593/1. Herniaria glabra L. An illustrated account of the embryology is given by Souèges (1938); on account of the linear tetrad this indicates an affinity with the Caryophyllaceae rather than with the Polygonaceae as suggested by Hutchinson.

596. Amaranthus L. The development of the embryo in *Amaranthus* shows the closest analogy with that of *Chenopodium Bonus-Henricus* and the Solanaceae.—Souèges (1937 A).

618. Rumex L. The North American species are monographed by Rechinger (1937).

626/1. Viscum album L. The mythology and folk-custom connected with the Mistletoe is described by " M.E." (1938).

Mistletoe occurs only on Conifers in N. Greece and is said to increase the yield of milk when used as fodder.—Balls (1938).

633. Ulmus L. Notes on Cornish forms are made by Rilstone (1938 A: 135).

634/1. HUMULUS LUPULUS L. For ecological anatomy see Makarova (1936).

642/1. BETULA ALBA L. The submerged forest in Pabbay, Outer Hebrides, described by Martin in 1703 was found by Elton (1938) to consist of this species and there is evidence of the survival into historical times of Birch woods on the mainland of Lewis.

645/1. CORYLUS AVELLANA L. Variation in the period of flowering of the pistillate flowers and of pollen-production and variation in first-flowering dates are discussed by Rilstone (1938 B): individual bushes appear to flower relatively at the same time from year to year.

Remains of this species were found by Elton (1938) under peat in Pabbay, Outer Hebrides, and there is evidence of the survival into historical times of Hazel woods on the mainland of Lewis.

646. QUERCUS L. A brief general account of *Q. Robur* L. ("*Q. pedunculata*") and *Q. petraea* Liebl. ("*Q. sessiliflora*") and their varieties is given by Bean (1938). Some well-known British specimens are mentioned. *Q. petraea* appears to be immune from attack by the *Tortrix* moth.

Chromosomes of *Quercus Robur* L. $2n = 24$. *Q. petraea* Liebl. $2n = 24$. *Q. Ilex* L. $2n = 24$.—Natividade (1937).

669. ORCHIS L. Notes on Cornish forms are made by Rilstone (1938 A: 136).

669/1. ORCHIS PURPUREA Huds. $n = 21$ in Danish specimens.—Hagerup (1938). $n = 21$, $2n = 42$ in Swiss specimens.—Heusser (1938: 581).

669/2. ORCHIS MILITARIS L. $n = 21$ in Danish specimens.—Hagerup (1938). $n = 21$, $2n = 42$ in Swiss specimens.—Heusser (1938: 580).

669/3. ORCHIS SIMIA Lam. $n = 21$. $2n = 42$ in Swiss specimens.—Heusser (1938: 580-581).

669/4. ORCHIS USTULATA L. $n. = 21$ in Danish specimens.—Hagerup (1938). $2n = 42$ in Swiss specimens.—Heusser (1938: 578).

669/5. ORCHIS MORIO L. $n = 18$ in Danish specimens.—Hagerup (1938). $n = 18$, $2n = 36$ [+ or − 1 exceptionally] in Swiss specimens.—Heusser (1938: 582).

669/6. ORCHIS PARDALINA Pugsl. Under the heading "*Orchis praetermissa* ssp. *junialis* mihi (=*O. latifolia* ssp. *junialis* mihi olim = perhaps also *O. pardalina* Pugsley)" Vermeulen (1938) gives $2n = 80$ in Dutch specimens. [This chromosome-number should not be accepted for British *O. pardalina* on this evidence.—P.M.H.]

669/7. ORCHIS LATIFOLIA L. (*sec.* Pugsley). Under the name *O. incarnatus* Hagerup (1938) gives $n = 20$ in Danish specimens. Heusser (1938: 567) gives $2n = 40$ in Swiss specimens.

669/7b. ORCHIS LATIFOLIA L. (*sec.* Pugsley) var. OCHROLEUCA (Boll.) Pugsl. Under the name *Orchis ochroleuca* Boll. (=*Orchis incar-*

natus var. *stramineus* Rchb.) Heusser (1938: 567) gives $2n = 40$ in Swiss specimens.

669/7×9(2). ORCHIS LATIFOLIA L. (*sec.* Pugsley) × MAJALIS Reichb. Swiss material of " *O. incarnata* L. × *latifolia* " gave $2n = 60$.—Heusser (1938: 569).

669/8. ORCHIS PRAETERMISSA Druce. Vermeulen (1938) gives $2n = 80$ (probably from Dutch specimens but not definitely stated).

669/9. ORCHIS PURPURELLA T. & T. A. Stephenson. Vermeulen (1938) gives $2n = 80$ (British specimens).

669/9(2). ORCHIS MAJALIS Reichb. Under the name *O. latifolius* Hagerup (1938) gives $n = 40$ in Danish specimens. Heusser (1938: 568) gives $2n = 80$ (" without exception ") in Swiss specimens. Vermeulen (1938) gives $2n = 80$ in Danish specimens.

669/9(2)b. ORCHIS MAJALIS Reichb. ssp. OCCIDENTALIS (Pugsl.) Pugsl. Vermeulen (1938) gives $2n = 80$ for Irish specimens collected by him in 1937.

669/10. ORCHIS MACULATA L. (*sec.* Druce). Hagerup (1938) gives $n = 40$ for " *O. maculatus* var. *genuinus* and var. *helodes* " (Danish). All Swiss material from woodland, moorland and alps except that from one locality (Schuls) gave $2n = 80$.—Heusser (1938: 569).

669/11. ORCHIS FUCHSII Druce. Hagerup (1938) gives $n = 20$ for " *O. maculatus* var. *Meyeri* " (Danish): see also p. 28 above. Material from one Swiss locality only (Schuls) gave $2n = 40$. Dutch material gives $2n = 40$.—Vermeulen (1938).

669/14. ORCHIS MASCULA L. $n = 21$ in Danish specimens.—Hagerup (1938). $2n = 42$ in Swiss specimens.—Heusser (1938: 575).

669/17. ANACAMPTIS PYRAMIDALIS (L.) Rich. $n = 18$, $2n = 36$ in Swiss specimens.—Heusser (1938: 595).

669/18. HIMANTOGLOSSUM HIRCINUM (L.) Koch. $n = 18$, $2n = 36$ in Swiss specimens.—Heusser (1938: 596).

671/1. ACERAS ANTHROPOPHORUM (L.) R. Br. $2n = 42$ in Swiss specimens.—Heusser (1938: 593-594).

672. OPHRYS L. Swiss material of *O. muscifera* Huds., *O. sphegodes* Mill., *O. arachnites* Lam. and *O. apifera* Huds. gives in each case $n = 18$, $2n = 36$.—Heusser (1938: 596-598).

673/1. HERMINIUM MONORCHIS (L.) R. Br. $n = 20$, $2n = 40$ in Swiss specimens.—Heusser (1938: 592).

674/1. GYMNADENIA CONOPSEA (L.) R. Br. Swiss material gives $n = 40$, $2n = 80$ in the " hill "-form (flowering in June), $n = 20$, $2n = 40$ in the " swamp "-, " moor "- and " alpine "-form (flowering in July).—Heusser (1938: 584-585). [It seems that the diploid plant corresponds to what in this country is known as var. *densiflora* (Wahl.) Lindl., while the tetraploid corresponds to what we are accustomed to call typical *G. conopsea* (L.) R. Br. of chalk downs, etc., but the question needs much further study.—P. M. HALL.]

674/3. GYMNADENIA ALBIDA (L.) Rich. $2n = 42$ in Swiss specimens.—Heusser (1938: 590).

674/4. COELOGLOSSUM VIRIDE (L.) Hartm. $2n = 40$ in Swiss specimens.—Heusser (1938: 590).

674/6. PLATANTHERA CHLORANTHA (Cust.) Reichb. $2n = 42$ in Swiss specimens.—Heusser (1938: 591).

674/7. PLATANTHERA BIFOLIA (L.) Rich. $n = 21$, $2n = 42$ in Swiss specimens.—Heusser (1938: 591).

681. GLADIOLUS L. The inheritance of fragrance is analysed by McLean (1938).

711/1. GAGEA LUTEA (L.) Ker-Gawler. Fruiting and seed-production is very exceptional, at least in Britain. Dallman (1938 A) describes the discovery of fruiting capsules in W. Yorks and suggests that the fruiting was the result of favourable conditions during March and early April 1938.

727. LEMNA L. A short account of the morphology of the British species is given by Pervival (1938 B).

740/1. ZOSTERA MARINA L. The dying out of *Zostera marina* L. in Portugal is noted.—Taborda de Morais (1937 A).

745. HELEOCHARIS Lestib. The species of *Heleocharis* occurring in the Rocky Mountain region are described and their distribution given by Beetle (1938). The following species which occur in Britain are dealt with: *H. pauciflora* (Lightf.) Link; *H. acicularis* (L.) Roem. & Schultes; *H. palustris* (L.) Roem. & Schultes; *H. palustris* var. *major* Sonder.

753/44. CAREX SALINA Wahl. The varieties of *Carex salina* Wahl. subsp. *cuspidata* Wahl. are discussed by Saxen (1938).

106. Gramineae. An attempt to give a precise morphological basis for Schellenberg's derivation of the Gramineae which is accepted by Wettstein and supported by serological investigations is made by Ziegenspeck (1938). Morphological and a few anatomical characters are employed and the conclusions summarised by a phylogenetic diagram.

756/1. SETARIA ITALICA (L.) Beauv. The effect of artificial wind on growth and transpiration is described by Rao (1938).

780. AGROSTIS L. Notes on Cornish forms are made by Rilstone (1938 A: 136).

794. AVENA L. The genetics of the genus are briefly discussed by Taborda de Morais (1938 C).

794/7. AVENA SATIVA L. The natural hybrids are discussed by Taborda de Morais (1937 B).

827. BROMUS L. Back crossing of the hybrid *B. madritensis* × *sterilis* with *B. sterilis* gave a single plant with characters identical with *B. sterilis* var. *velutinus* auct. named ×*B. Fischeri* f. *persterilis* Cugnac & Camus in 1931.—Cugnac (1937).

829. LOLIUM L. According to Jenkin and Thomas (1938) " at least six general *Lolium* types, or groups, are sufficiently distinct to rank

as independent species.'' These are *L. perenne* L. and *L. italicum* A. Br. (non-annual; wind-pollinated): *L. rigidum* Gaud. (annual; wind-pollinated): *L. loliaceum* Hand.-Maz. (of Australian origin), *L. remotum* Schrank, and *L. temulentum* L. (annual; self-pollinated). From six species fifteen interspecific hybrids are possible, of which eleven have been produced by hand-pollination. All six parent species are diploids ($n = 14$) and details are given of the successful crosses with special notes on anther dehiscence, pollen production and behaviour in meiosis.

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Note.—This bibliography refers not only to the Abstracts from Literature but to the contents of the Report in general, except such papers as have their own bibliographies.

Abbreviations of Titles of Periodicals

additional to lists previously published in *B.E.C. 1935 Rep.*, 153-155 (1936), *B.E.C. 1936 Rep.*, 383 (1937), and *B.E.C. 1937 Rep.*, 631 (1938).

AB.Fenn. = Acta Botanica Fennica.
Amer.M.Nat. = American Midland Naturalist.
B.Jard.bot.Brux. = Bulletin du Jardin botanique de l'Etat, Bruxelles.
BSSN.S. et O. = Bulletin de Société de Science Naturelle de Seine et Oise.
CR.Acad. des Sc.Paris = Compte rendu hebdomaire des Séances de l'Académie des Sciences, Paris.
JIB.Ukr. = Journal de l'Institut Botanique de l'Academie Scientifique de la RSSR. d'Ukraine.
JM.Agric. = Journal of the Ministry of Agriculture.
PNAS.U.S.A. = Proceedings of the National Academy of Sciences of the U.S.A.
PU.Durham PS. = Proceedings of the University of Durham Philosophical Society.
TBS.Edin. = Transactions of the Botanical Society of Edinburgh.
U.Wyoming Publ. = University of Wyoming Publications.

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BOTANY.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1938

OF THE

BOTANICAL EXCHANGE CLUB

(CONVENIENTLY ABBREVIATED B.E.C. 1938 REP.)

BY

THE DISTRIBUTOR,
JOHN F. G. CHAPPLE, Esq.,

THE LATE HONORARY EDITOR,
PATRICK M. HALL, Esq.,

AND

THE HONORARY ACTING EDITORS,
E. C. WALLACE, Esq.,
2 Strathearn Road, Sutton, Surrey,

A. J. WILMOTT, Esq.,
Natural History Museum, Cromwell Road, London,
S.W.7.

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(VOL. XII. PART II).

Victoria Regina.

Floreat flora.

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March 1942.

The causes of the delay in the publication of the Society's Reports have seen set out in the " Report on the State of the Society's Affairs " recently distributed to members. With the exception of the promised Reports on the Excursions (see p. 17) the second part of the Report for 1938 was ready for printing long ago, but after the departure of the Secretary on active service the heavy burden of war duties undertaken by the Editor prevented him from attending to this Report before the onset of his fatal illness. Mr Hall was intending to amplify his introductory remarks, but in the circumstances the acting editors prefer to print the proof as it was left by him, with the addition only of the Reports of the Excursions.

A. J. WILMOTT.
E. C. WALLACE.

REPORT ON THE EXCURSIONS ARRANGED IN 1938.

Six excursions were arranged, five of which took place.

May 28. S. Wilts., v.-c. 8. Potterne Biological Station, Devizes. Leader, Mr E. Marsden Jones.

Unfortunately, this excursion had to be cancelled, as Mr Marsden Jones was taken seriously ill at the last moment. His illness was prolonged, but we are glad to say that he now hopes that in time his recovery will be complete. He asks us to inform members that although the Potterne Station was closed down at the end of September 1940, the British plants were transferred to Drentsey's School, West Lavington, Wiltshire, where they are still under his supervision, and are arranged in biological beds as they were at Potterne. Anyone requiring material for research should apply to the Headmaster.

June 10-13. S. Devon, v.-c. 3. The Coast in the Neighbourhood of Salcombe. Leader, Mr G. T. Fraser.

June 10. The party, numbering 16, assembled during the afternoon and evening at the Salcombe Hotel, Salcombe, the headquarters for the excursion.

June 11. The party left Salcombe at about 9.15 a.m. by char-a-banc for Hope Cove, via Malborough. About an hour was spent at Hope, an interesting fishing village situated on a very wild and rocky portion of the coast. Some interesting plants occur here, including forms of *Anthyllis Vulneraria* that might repay further study and *Orobanche maritima* Pugsl. (*O. amethystea* auct. angl.) growing on *Daucus*, the latter rather plentifully in some seasons. The party proceeded to Sewer Mill Cove, following the cliffs and passing over Bolt Tail with its fine cliff scenery. *Sagina Reuteri* (or what passes for it among British botanists), *Rosa spinosissima*, and *Euphrasia occidentalis* var. *praecox* were collected. At Sewer Mill Cove, where a sandwich lunch was eaten, some wet ground above the beach produced a few interesting sedges. A colony of *Rumex rupestris* occurs here, but the plants were in poor condition. A recent south-easterly gale had much damaged by wind and spray all the coastal vegetation in this area. Very luxuriant plants of *Asplenium marinum* were seen; also a large patch of *Scilla verna*. The walk was continued along the coast towards Bolt Head. A damp patch on the cliffs above Steeple Cove contained *Radiola Linoides* and *Centunculus minimus* growing together as they so often do. Bolt Head and Sharpitor provided some interesting plants; *Geranium sanguineum* occurs, and a 1935 record for *Erodium neglectum* was confirmed. In a bog behind Bolt Head, *Orchis praetermissa*, *O. pardalina* Pugsl., and intermediates, were collected. At Starehole, the wreck of the Finnish sailing ship—Hertzogin Cecilie—

was seen. Tea was obtained at the Bolt Head Hotel during the only serious fall of rain which occurred in the course of the excursion. After tea, some of the party visited Sharpitor House, just taken over by the National Trust. The grounds contain a fine collection of foreign trees, shrubs and herbaceous plants, many of them from New Zealand and Australia. The mild climate suits them admirably, and the place was well worth visiting. Salcombe was reached about 7 p.m., the party having covered about 10 miles of coast during the day. The ballroom at the hotel was placed at our disposal during the evening—and also on the following evening—for discussion and examination of specimens.

June 12. Crossing by the ferry to East Portlemouth, the party proceeded by the eastern shore of Salcombe Harbour to Rickham Common. Marsh Orchids were examined in swampy ground near East Portlemouth; *Rosa spinosissima* and *Jasione montana* var. *latifolia* occurred sparingly at a few places, and some very dwarf plants of *Hypochaeris glabra* were collected at Rickham Common. *Geranium sanguineum* is abundant on the coast for about four miles. Below Gara Rock, where a sandwich lunch was eaten, and under Deckler's Cliff, *Lotus hispidus* occurs in considerable quantity, and between Deckler's Cliff and Gammon Head *Ruscus aculeatus* is a conspicuous feature of cliff crevices. Some of the party remained at Gammon Head looking for plants and watching the young gulls, while the more energetic members went on to Prawle Point and East Prawle village and were rewarded by finding *Geranium purpureum*, *Trifolium glomeratum*, and *Bromus lepidus*. The party assembled at Gara Rock Hotel for tea, and returned to Salcombe via East Portlemouth and the ferry, having covered about 10 miles.

June 13. The party separated and returned home. Some of them visited the quay at Kingsbridge and collected some interesting grasses. They also visited Slapton and Berry Head on their way home.

Although not a large one, the party, which consisted of 15 members and a visitor, saw and collected many interesting plants, and obtained a number of records new for the district covered. These were all included in the *Flora of Devon*, published subsequently. The hotel was comfortable, its management looked after us well, and the fine weather helped to make things pleasant.

A list of the more interesting plants noted and collected is given below. N.C.R. = New to Devon. N.D.R. = New to Dist. vii of the *Flora of Devon*. * = New vice-county record. † = Not native: as usual in these Reports.

Viola hirta L. var. *calcarea* Bab. East Portlemouth, Deckler's Cliff; det. P. M. Hall. N.D.R.

Sagina ciliata Fr. Chivelstone, Gammon Head; det. F. R. Elliston Wright.

S. Reuteri Lange. Malborough, Bolt Tail; and Chivelstone, Gammon Head; "well under what British botanists have called *S. Reuteri*," F.R.E.W.

Lavatera arborea L. At intervals along the cliffs.

Radiola Linoides Roth. Malborough, Steeple Cove.

Geranium sanguineum L. Malborough; Chivelstone; and East Portlemouth.

G. purpureum Vill. Chivelstone, East Prawle. N.D.R.

Erodium maritimum (L.) L'Herit. Plentiful on bare headlands throughout.

E. neglectum Baker f. & Salmon. Malborough, Sharpitor.

Trigonella ornithopodioides (L.) DC. Malborough; East Portlemouth; and Chivelstone.

Trifolium glomeratum L. Chivelstone; East Prawle.

Lotus hispidus Desf. East Portlemouth; Chivelstone; frequent between Rickham Common and Gammon Head.

Rosa spinosissima L. Malborough, Bolt Tail; East Portlemouth, Rickham Common; Chivelstone, above Gammon Head.

Epilobium lanceolatum Seb. & Maur. Salcombe, Sharpitor; det. G. M. Ash.

†*Oenothera stricta* Ledeb. (*O. odorata* Jacq.). East Portlemouth, Gara Rock, a large colony, well established.

Valerianella dentata Poll. var. *mixta* (L.) Dufr. Chivelstone, East Prawle.

Hypochaeris glabra L. East Portlemouth, Rickham Common; Chivelstone, Gammon Head.

Jasione montana L. var. *latifolia* Pugsl. East Portlemouth, Sandy Cove and Rickham Common; Chivelstone, Gammon Head.

Centunculus minimus L. Malborough, Steeple Cove.

†*Symphytum peregrinum* Ledeb. Salcombe, near Tide End.

Scrophularia Scorodonia L. Salcombe.

Euphrasia occidentalis Wettst. *var. *praecox* Bucknall. Malborough, near Hope Cove; det. H. W. Pugsley. N.C.R.

*Var. *minor* Pugsl. East Portlemouth, near Rickham Common; det. H. W. Pugsley.

Orobanche maritima Pugsl. (*O. amethystea* auct. angl.). South Huish, Hope Cove.

Rumex rupestris Le Gall. Malborough, Sewer Mill Cove; East Portlemouth, near Gara Rock; Chivelstone, Gammon Head.

Orchis. All determined by T. Stephenson.

O. pardalina Pugsl. Malborough, near Bolt Head; East Portlemouth, Sandy Cove; Chivelstone. N.D.R.

O. praetermissa Druce. Salcombe, Tide End; Malborough, near Bolt Head; East Portlemouth, Sandy Cove. Intermediates with the preceding were collected in the two localities where both occurred together.

O. maculata L. (*O. Fuchsii* Druce). Salcombe, Sharpitor. N.D.R.

Ruscus aculeatus L. Chivelstone, Pig's Nose to Gammon Head.

†*Allium triquetrum* L. East Portlemouth, Rickham.

Scilla verna Huds. Malborough, Sewer Mill Cove.

Luzula Forsteri (Sm.) DC. East Portlemouth.

Carex distans L. Malborough, Sewer Mill Cove.

C. viridula Michaux (*C. Oederi* auct. non Retz.), var. **oedocarpa** (Anderss.) Wilmott comb. nov. Malborough, Starehole; det. E. Nelmes (as *C. Oederi*, var. *oedocarpa*).

C. extensa Good. Malborough, Sewer Mill Cove.

C. Pairaei F. Schultz. Chivelstone, East Prawle.

Dactylis glomerata L. var. *congesta* Coss. & Germ. East Portlemouth, Gara Rock.

Puccinellia distans (L.) Parl. Kingsbridge Quay.

P. rupestris (With.) Fern. & Weatherby. Kingsbridge Quay. A hybrid with the preceding was determined, with some doubt, by C. E. Hubbard.

Catapodium loliaceum (Huds.) Link. East Portlemouth, Rickham Common.

Festuca rubra L. var. *glaucescens* (Heg. & Heer) Richt. East Portlemouth; Chivelstone; Malborough; at intervals along the coast.

×*F. loliacea* Huds. Salcombe, Tide End.

Bromus hordeaceus L. *var. *Thominii* (Bréb.) Asch. & Graebn. East Portlemouth ("with some doubt," C. E. Hubbard); Kingsbridge ("probably," C. E. Hubbard). N.C.R.

B. lepidus Holmberg. Chivelstone, East Prawle. N.D.R.

B. hordeaceus × *lepidus*. Chivelstone, East Prawle. C. E. Hubbard considered that a plant growing with the reputed parents may be this hybrid. N.C.R.

Lolium perenne L. *var. *longiglume* Grantzow. Kingsbridge Quay; det. C. E. Hubbard. N.C.R.

Dryopteris Linneana C. Chr. Salcombe, Sharpitor; perhaps planted, but that is unlikely.

G. T. F.

June 25. Surrey, v.-c. 17. An afternoon in the neighbourhood of Ash. Leader, Lady Davy.

This excursion, which was mainly to explore a large bog and a piece of the Basingstoke Canal, was rather spoilt by the very dry weather. No rain having fallen during the month, the bog plants were suffering from drought, but *Eriophorum gracile* and several nice orchids were found. The Basingstoke Canal was also in bad condition, the *Ranunculus circinatus* there being quite spoilt by mud and stagnant water. The party, which consisted of 12 members and 5 visitors, enjoyed a very good tea and discussed the afternoon's discoveries.

J. C. D.

July 11-16. Westmorland, v.-c. 69. Investigation of the highlands and the Eden Valley between Brough and Penrith. Leaders, Dr R. W. Butcher and Miss C. Rob.

The object of this excursion was to discover how the flora of the southern slopes of the Mickle Fell range, which face the Eden Valley, compared with the more familiar flora of the northern slopes, which face the Tees Valley. The party consisted of 28 members and 7 visitors. While the main work was done on the hills, many members enjoyed seeing the rare plants of the Eden Valley under the guidance of Dr Sprott.

Unfortunately, the searching parties were handicapped by poor weather and mists, but the plants found show without doubt that the absence of records of rare plants is because such plants do not occur in this district. With the single exception of *Scrophularia umbrosa* on the banks of the Eden, no plants were found which had not been recorded by Mr Wilson in his recently published *Flora of Westmorland*.

The areas visited were as follows:—

(a) Rundale Beck and Swindale Beck. The flora was generally poor and no specially uncommon plant was seen.

(b) High Cup Nick. The cliffs were thoroughly explored, but the party failed to find the previously recorded rare plants, viz., *Sibbaldia procumbens*, *Saxifraga nivalis*, *Pyrola secunda*, and *Carex capillaris*.

(c) Hilton Gill. The conspicuous plants of this region were Hieracia which have not yet been identified; otherwise the flora was similar to that of Rundale Beck.

(d) Angill and Foxhall Wood. The flora of Angill was very poor and consisted only of widely distributed species of the " Germanic " element. The feature of the limestone scars between Angill and Hillbeck Wood was the abundance of *Primula farinosa.* Neither Foxhall Wood nor the pools in it yielded anything noteworthy. A pondweed (probably *Potamogeton Berchtoldii* Fieb. = *P. pusillus* auct.) was seen in the lake by Hillbeck House.

In spite of the lack of new and interesting records, the party had a very interesting time, and even their negative observations are of interest.

A list of Vascular Cryptogams observed—sent in by Mr A. H. G. Alston—follows below: —

Equisetum silvaticum L. Above Brough.
E. variegatum L. High Cup Nick, and bog near Orton (found by Miss Rob).
Asplenium viride Huds. Common; Beacon Hill (on limestone) and High Cup Nick (not limestone).
A. Adiantum-nigrum L. Rather rare; Brough (Miss Rob).
Dryopteris Filix-mas (L.) Schott var. *paleacea* (Don) Druce. Abundant on the west side of the Pennines.
D. Villarsii (Bell.) Woynar (*D. rigida* (Sw.) Underwood). Beacon Hill, on Orton Scar.
D. Oreopteris (Ehrh.) Maxon. Abundant on the west side of the Pennines.
D. Phegopteris (L.) C. Chr. Above Brough, and seen by Dr Lawn below High Cup Nick.
D. Robertiana (Hoffm.) C. Chr. Beacon Hill and High Cup Nick.
Botrychium Lunaria (L.) Sw. Above Brough.
Lycopodium alpinum L. One plant found by Mr Shaw below High Cup Nick.
L. clavatum L. One plant found by Mrs Sandwith above Brough.
L. Selago L. Common at High Cup Nick.
Selaginella selaginoides (L.) Link. Beacon Hill and High Cup Nick.

R. W. B.

August 13-15. E. Norfolk, v.-c. 27. Broads and Fens. Leader, Mr E. A. Ellis.

August 13. Members assembled in the morning at Horning Ferry and proceeded to Alderfen Broad, where separate parties investigated the fen and the waters of the broad. After a picnic lunch and further exploration of this area, a visit was made to Bryant's Heath, Felmingham, in the North Walsham district, chiefly to see *Hammarbya paludosa* growing in the bog there.

August 14. The party gathered at Upton church at 11 a.m. and went on to Upton Broad, an extensive sedge-fen little known botanically. Among the more interesting finds here were *Pyrola rotundifolia* and a single plant of *Liparis Loeselii.* All the types of plant community at Upton were inspected and several members made a long trek across to the reclaimed grazing marshes between the fen and the river Bure, by way of contrast. To end the excursion, Dr and Mrs B. B. Riviere very kindly provided tea in the gardens of Woodbastwick Old Hall.

14 members and 8 visitors took part in the excursions.

NOTES ON THE AREAS VISITED.

Alderfen Broad is a Nature Reserve comprising 68 acres of broad, reed-beds, alder carr and rough fen, the property of the Norfolk Naturalists' Trust. The water of the broad is about pH 6-7 in summer and commonly supports a "water-bloom" phyto-plankton, large beds of water-lilies and a quantity of *Utricularia vulgaris*. It has many islands of *Typha angustifolia*, *Phragmites* and *Scirpus lacustris*, with a good deal of *Cicuta virosa*. *Stratiotes aloides* is abundant in the bays and dykes at the edge. The reed-swamp is succeeded by fen, which in the early stages is variously composed of *Cladium* or of *Glyceria* and *Phalaris* according to the proximity of springs supplying the broad. The *Cladium* area has in places been over-run by alder trees to form fen-carr, but farther back it has developed into mowing marsh and eventually wet heath with *Calluna* and *Erica Tetralix*. The presence of *Scirpus Tabernaemontani* and *Oenanthe Lachenalii* in the fen probably indicates an earlier maritime influence. No previous account of the flora has been published.

Bryant's Heath, Felmingham, is a small common of about 37 acres comprising furze and heathland, bounded on one side by a bog and a small stream margined with reeds and alders. On the dry heath, gorse and heaths are dominant, three species of *Ulex* all growing together, *U. minor* and *U. Gallii* being in bloom at the time of the excursion. The more interesting boggy portion contains patches of *Sphagnum*, in a restricted area of which *Hammarbya paludosa* is quite plentiful (first recorded from this locality in 1935 by A. E. Ellis). It was noticed that *Scirpus setaceus* was very local and *S. pygmaeus* widely spread; *Eleocharis palustris* was much rarer than *E. multicaulis*.

Upton Broad comprises something approaching 200 acres of grown-up broadland, with shallow, restricted pools in the midst of reed-swamp and much *Cladium* fen, and with small interspersed patches of alder and sallow carr. Portions of the fen are periodically mown or burnt, and the mown areas support a rich flora including several sub-acid types such as *Parnassia palustris*, *Scabiosa Succisa* and *Pyrola rotundifolia*, together with a good number of orchids. *Lathyrus palustris* was found commonly in several parts of the fen. No *Sphagnum* was noticed here during the excursion, and the solitary example of *Liparis Loeselii*, found in fruit, was growing with many other orchids in a fairly open area among *Dryopteris Thelyptris*, sparse *Phragmites* and sedges, with a *Hypnoid* moss flora on the ground.

A comparative list of the plants found in the three areas visited has been compiled from notes supplied by Messrs A. E. and E. A. Ellis and Mr C. T. Prime; Dr Lawn provided records of *Epilobium obscurum* and *E. palustre*, and many other members pooled the results of their observations at the time of the excursion.

LIST OF THE PLANTS FOUND AT ALDERFEN BROAD (A.), BRYANT'S HEATH (B.), AND UPTON BROAD (U.).

(The absence of bracketed letters after the name of a plant indicates that the species was found in all three stations.)

Ranunculus repens L.; *R. acer* L.; *R. bulbosus* L. (U.); *R. Lingua* L. (A., U.); *R. Flammula* L.; *R. sceleratus* L. (U.).

Caltha palustris L.

Nuphar lutea (L.) Sm. (A., U.).
Nymphaea alba L. (A., U.).
Nasturtium officinale R. Br. (B., U.).
Cardamine pratensis L. (A., B.); *C. amara* L. (U.).
Sisymbrium Thaliana (L.) Gay (B.).
Viola canina L. emend. Reich. (B.); *V. palustris* L. (A., B.).
Polygala vulgaris L. (B.).
Lychnis Flos-cuculi L.; *L. dioica* L. (B., U.).
Cerastium erectum (L.) Coss. & Germ. (B.); *C. vulgatum* L.
Stellaria media (L.) Cyr. (B., U.); *S. Dilleniana* Moench emend. var. *palustris* (Retz.) Druce (A.); *S. graminea* L. (B., U.); *S. uliginosa* Murr.
Arenaria trinervia L. (B.).
Sagina nodosa (L.) Fenzl (B.); *S. procumbens* L. (B.).
Hypericum quadrangulum L. (*H. acutum* Moench); *H. elodes* L. (B.).
Radiola Linoides Roth. (B.).
Geranium molle L. (B.); *G. Robertianum* L. (B., U.).
Ilex Aquifolium L. (A., B.).
Rhamnus Frangula L. (A., U.).
Acer campestre L. (U.).
Genista anglica L. (B.).
Ulex europaeus L. (B.); *U. Gallii* Planch. (B.); *U. minor* Roth (B.).
Cytisus scoparius (L.) Link (B.).
Trifolium pratense L.; *T. striatum* L. (B.); *T. fragiferum* L. (B.); *T. repens* L.; *T. dubium* Sibth. (A., B.).
Lotus uliginosus Schk.; *L. corniculatus* L. (B.).
Vicia Cracca L. (A., U.); *V. hirsuta* (L.) S. F. Gray (U.).
Lathyrus palustris L. (U.); *L. pratensis* L. (U.).
Prunus domestica L. (U.); *P. spinosa* L. (B.).
Spiraea Ulmaria L.
Rubus Idaeus L. (B., U.); *R. fruticosus* L. agg.
Potentilla Anserina L.; *P. erecta* (L.) Hampe; *P. sterilis* (L.) Garcke (B.); *P. palustris* (L.) Scop. (A., U.).
Alchemilla arvensis (L.) Scop. (B.).
Agrimonia Eupatoria L. (B.).
Rosa canina L. agg.
Crataegus monogyna Jacq.
Parnassia palustris L.
Drosera anglica Huds. (B.); *D. longifolia* L. (B.); *D. rotundifolia* L. (B.).
Myriophyllum spicatum L. (A., U.); *M. verticillatum* L. (U.).
Callitriche stagnalis Scop. (B.).
Lythrum Salicaria L. (A., U.).
Epilobium hirsutum L.; *E. parviflorum* Schreb. (B., U.); *E. obscurum* Schreb. (A., U.); *E. palustre* L.
Hydrocotyle vulgaris L.
Apium nodiflorum (L.) Reich. fil. (B., U.).
Cicuta virosa L. (A.).
Sium latifolium L. (U.); *S. erectum* Huds.
Anthriscus silvestris (L.) Hoffm. (U.).
Oenanthe Lachenalii C. Gmel. (A., U.); *O. fistulosa* L.
Angelica sylvestris L.
Peucedanum palustre Moench (A., U.).
Heracleum Sphondylium L. (B., U.).
Caucalis Anthriscus Huds. (U.).
Hedera Helix L. (B., U.).
Sambucus nigra L. (B., U.).
Viburnum Opulus L. (A., U.).
Lonicera Periclymenum L.
Galium saxatile L. (B.); *G. uliginosum* L. (A., U.); *G. palustre* L.; *G. Aparine* L.
Valeriana officinalis L.; *V. dioica* L.
Scabiosa Succisa L.

Eupatorium cannabinum L. (A., U.).
Bellis perennis L. (B.).
Pulicaria dysenterica (L.) Bernh.
Achillea Millefolium L. (A., B.).
Artemisia vulgaris L. (U.).
Tussilago Farfara L. (U.).
Senecio aquaticus Hill (B., U.); *S. Jacobaea* L. (B.); *S. erucifolius* L. (B.); *S. silvaticus* L. (B.).
Cirsium lanceolatum (L.) Scop. (B., U.); *C. pratense* (Huds.) DC. (A., U.); *C. arvense* (L.) Scop. (B., U.); *C. palustre* (L.) Scop.
Centaurea nigra L. agg. (A., U.); *C. nemoralis* Jord. (B.).
Lapsana communis L. (B., U.).
Hieracium Pilosella L. (B.).
Hypochaeris radicata L. (A., B.).
Leontodon Leysseri (Wallr.) Beck (*L. nudicaulis* Banks) (A., B.).
Taraxacum sp.
Sonchus arvensis L. (A.); *S. asper* (L.) Hill (A., U.).
Campanula rotundifolia L. (B.).
Calluna vulgaris (L.) Hull (A., B.).
Erica cinerea L. (B.); *E. Tetralix* L. (A., B.).
Pyrola rotundifolia L. (U.).
Hottonia palustris L. (A.).
Primula vulgaris Huds. (B.).
Lysimachia vulgaris L. (A., U.); *L. nemorum* L. (B.).
Anagallis arvensis L. (U.); *A. tenella* Murr. (B., U.).
Samolus Valerandi L. (U.).
Fraxinus excelsior L. (U.).
Centaurium umbellatum Gilib. (B.).
Menyanthes trifoliata L.
Myosotis palustris (L.) Hill (A., U.); *M. caespitosa* Schultz (B., U.); *M. arvensis* (L.) Hill (B.).
Calystegia sepium (L.) R. Br. (U.).
Cuscuta epithymum (L.) Murr. (B.).
Solanum Dulcamara L.
Scrophularia aquatica L. (A., U.).
Veronica officinalis L. (A.); *V. Chamaedrys* L. (A., B.); *V. scutellata* L. (B., U.); *V. Beccabunga* L. (B.); *V. arvensis* L. (B.).
Euphrasia officinalis L. agg.
Bartsia Odontites Huds. (B.).
Pedicularis palustris L.; *P. silvatica* L. (B.).
Rhinanthus minor Ehrh. (*R. Crista-galli* auct.) (A., U.).
Utricularia vulgaris L. (A., U.).
Mentha aquatica L.
Lycopus europaeus L. (A., U.).
Nepeta hederacea (L.) Trev. (B., U.).
Scutellaria galericulata L. (A., U.).
Prunella vulgaris L.
Stachys silvatica L. (B., U.); *S. palustris* L. (U.).
Galeopsis Tetrahit L. (U.).
Lamium album L. (B.); *L. purpureum* L. (B.).
Teucrium Scorodonia L. (B.).
Plantago Coronopus L. (B.); *P. lanceolata* L.; *P. major* L. (B., U.).
Polygonum Convolvulus L. (A.); *P. amphibium* L. (A., U.); *P. Lapathifolium* L. (A., U.); *P. Persicaria* L. (U.); *P. Hydropiper* L. (A., U.).
Rumex Hydrolapathum Huds. (A., U.); *R. crispus* L. (B., U.); *R. nemorosus* Schrad. (B., U.); *R. conglomeratus* Murr. (B., U.); *R. Acetosa* L.; *R. Acetosella* L. (B.).
Daphne Laureola L. (B.).
Ulmus sp. (U.).
Urtica dioica L.

Myrica Gale L. (A., U.).

Betula alba L.; *B. pubescens* Ehrh. (A., U.), var. *vestita* G. & G. (B.).

Alnus glutinosa Gaertn.

Quercus Robur L.

Salix fragilis L. (U.); *S. alba* L.; *S. viminalis* L. (U.); *S. aurita* L. (B.); *S. atrocinerea* Brot.; *S. repens* L.

Populus tremula L. (U.); ? *P. nigra* L. (U.).

Ceratophyllum submersum L. (U.).

Hydrocharis Morsus-Ranae L. (U.).

Stratiotes Aloides L. (A., U.).

Hammarbya paludosa (L.) (*Malaxis paludosa* (L.) Sw.) (B.).

Liparis Loeselii (L.) Rich. (U.).

Listera ovata (L.) R. Br. (A., U.).

Epipactis palustris (L.) Crantz (A., U.).

Orchis latifolia L. (*O. incarnata* auct.) (A., U.); *O. praetermissa* Druce (A., B.); *O. maculata* L. (*O. Fuchsii* Druce) (A.); *O. ericetorum* (Linton) Marshall (*O. maculata* Druce et. al.) (B.).

Gymnadenia conopsea (L.) R. Br. (U.).

Platanthera bifolia (L.) Rchb. (U.).

Iris Pseudacorus L.

Tamus communis L. (B., U.)

Juncus conglomeratus L. em. Koch; *J. glaucus* Ehrh. (*J. inflexus* auct.) (U.); *J. subnodulosus* Schrank; *J. acutiflorus* Ehrh. (B.); *J. articulatus* L. em. Wahl. (B., U.); *J. bulbosus* L. (B.); *J. bufonius* L. (A., U.).

Luzula campestris (L.) DC.

Typha angustifolia L. (A., U.).

Sparganium neglectum Beeby (B.); *S. ramosum* Huds. (A., U.); *S. simplex* Huds. (U.).

Arum maculatum L. (B.).

Lemna minor L.; *L. polyrhiza* L. (U.); *L. trisulca* L. (A., U.); *L. gibba* L. (U.).

Alisma Plantago-aquatica L. (A., U.).

Baldellia ranunculoides (L.) Parl. (*Echinodorus Ranunculoides* (L.) Engelm.) (B.).

Sagittaria sagittifolia L. (U.).

Triglochin palustre L. (B., U.).

Potamogeton natans L. (A.); *P. polygonifolius* Pourr. (B.); *P. Berchtoldii* Fieb. (*P. pusillus* auct.) (U.); *P. pectinatus* L. (U.).

Zannichellia palustris L. (U.).

Eleocharis palustris (L.) R. Br.; *E. multicaulis* Sm. (B.).

Scirpus lacustris L. (A., U.); *S. Tabernaemontani* Gmel. (A., U.); *S. setaceus* L. (B.); *S. pygmaeus* A. Gray (*S. filiformis* Savi) (B.).

Eriophorum angustifolium Roth (B.).

Rhynchospora alba (L.) Vahl (B.).

Schoenus nigricans L. (A., U.).

Cladium Mariscus Br. (A., U.).

Carex Pseudo-cyperus L. (A., U.); *C. riparia* Curt. (U.); *C. acutiformis* Ehrh. (U.); *C. vesicaria* L. (A.); *C. rostrata* Stokes in With. (*C. inflata* auct. non Huds.) (A., B.); *C. hirta* L. (B.); *C. flava* L. (B., U.); *C. viridula* Michx. (*C. Oederi* auct. non Retz.) (B.); *C. caryophyllea* Latour. (B.); *C. panicea* L.; *C. Hudsonii* Ar. Benn. (*C. elata* auct.) (A.); *C. Goodenowii* Gay (A., B.); *C. stellulata* Good. (B.); *C. remota* L. (A., B.); *C. canescens* L. (B.); *C. Otrubae* Podpera (*C. vulpina* auct.) (U.); *C. paniculata* L. (A., U.); *C. disticha* Huds. (A., U.); *C. pulicaris* L. (A.); *C. dioica* L. (B.).

Phalaris arundinacea L. (A.).

Anthoxanthum odoratum L.

Alopecurus geniculatus L. (U.).

Agrostis stolonifera L. (*A. alba* auct.) (B., U.); *A. canina* L. (A.).

Calamagrostis canescens (Weber em.) Gmel. emend Druce (*C. lanceolata* Roth) (U.).

Aira praecox L. (B.).

Holcus lanatus L.

Arrhenatherum elatius (L.) Mert. & Koch (U.)

Sieglingia decumbens (L.) Bernh. (B.).
Phragmites communis Trin.
Cynosurus cristatus L. (B., U.).
Molinia caerulea (L.) Moench.
Dactylis glomerata L. (A., U.).
Briza media L.
Poa pratensis L.; *P. trivialis* L. (A., U.); *P. annua* L. (B.).
Glyceria aquatica (L.) Wahl. (A., U.).
Festuca elatior L. (U.); *F. ovina* L. (B.).
Lolium perenne L. (U.).
Agropyrum repens (L.) Beauv. (U.); *A. caninum* (L.) Beauv. (U.).
Nardus stricta L. (A., B.).
Pinus silvestris L. (B.).
Equisetum arvense L. (B., U.); *E. fluviatile* L. (*E. limosum* L.) (U.); *E. palustre* L.
Pteridium aquilinum (L.) Kuhn (*Eupteris aquilina* (L.) Newm.) (B., U.).
Athyrium Filix-foemina (L.) Roth (B.).
Dryopteris Filix-mas (L.) Schott (A., B.); *D. aristata* (Vill.) Druce (B.); *D. Thelypteris* (L.) A. Gray (A., U.).
Polypodium vulgare L. (A.).
Ophioglossum vulgatum L. (A.).

E. A. E.

September 24. E. Kent, v.-c. 15. An afternoon at Shellness (adjoining the Isle of Harty). Leader, Mr J. E. Lousley.

The object of this excursion was to examine a small part of the Kent coast where discoveries of some interest might be expected. A small area with a very varied flora, which was not known to produce any really rare plants, and which was sufficiently inaccessible not to have been repeatedly visited by botanists in the past, was therefore selected for the visit. Shellness, the S.E. point of the Isle of Sheppey, is a delightful spit composed almost entirely of the remains of the shells of cockles and other mollusca. From the main spit lateral branches extend westwards into a salt-marsh bounded by the sea-wall beyond which extend the pastures of the Isle of Harty. A recently cut dyke showed that a bed of shells, covered by a variable thickness of mud, extends under much of the salt-marsh.

The twenty-two members who assembled were fortunate in having fine weather during the official excursion. The area—entirely on private land—was examined by kind permission of the owner, whose interest in wild-flowers was demonstrated by the notice in the car-park requesting visitors not to pick them.

A feature of the outer marsh was the colonisation of the mud by *Spartina Townsendii*, and many members were glad of the opportunity of comparing this with the less aggressive *S. stricta* of the older more stabilised salt-marsh near the sea-wall. Masses of *Aster Tripolium* (both rayed and discoid) and *Inula crithmoides* in full flower lent a pleasant colouring to the marsh.

One of the best discoveries of the day was *Polygonum Raii* in good quantity; this plant is now very scarce on the Kent coast. Lady Davy, with her usual acumen for grasses, found *Puccinellia fasciculata* Bickn. (*Glyceria Borreri* Bab.) flowering again after the summer.

Two plants of the cockle-shell spit, frequent elsewhere as introductions, may well be native here—*Senecio viscosus* and a neat form of *Lactuca Serriola*.

The following list includes some of the other plants in which members were interested :—

Glaucium flavum Crantz.
Cakile maritima Scop.
Arenaria peploides L.
Spergularia marginata (DC.) Kittel.
S. salina J. & C. Presl.
Eryngium maritimum L.
Bupleurum tenuissimum L.
Artemisia maritima L.—very variable.
Carduus tenuiflorus Curt.
Limonium binervosum (G. E. Sm.) C. E Salmon.
Atriplex littoralis L.
A. laciniata L. (*A. maritima* Hallier).
Beta maritima L.—exceedingly variable.
Potamogeton interruptus Kit.

The genera *Atriplex*, *Salicornia*, and *Agropyron* were represented by very numerous critical forms, and the first two genera received considerable attention from the experts present.

After tea Dr Lawn made a brief speech proposing a vote of thanks to the leader for organising the excursion.

J. E. L.

REPORT BY THE HON. EDITOR.

The very late appearance of the Distributor's Report for 1938 calls for an explanation but members will no doubt already have realised that it was held up by exceptional circumstances.

The Distribution was carried out in the usual way by Mr Chapple and he seems to have had great difficulty in getting parcels and comments returned by some of the Referees, so that the draft of this Report was not completed when Mr Chapple was mobilized for service with his Territorial A.A. battery in July 1939. Some months later when he had a few days leave at Oxford he finished the draft and sent it to me with such notes and letters from contributors and Referees as he could lay his hands on. On going through these I found that many notes were missing and this resulted in correspondence with several of the Referees, which occupied a considerable time. Even now it has not been possible to recover all the notes and comments, so that the Report is by no means complete.

In editing Mr Chapple's draft I have made some changes which it is thought will result in an improvement in the Report and also effect an economy in paper and print. It has been customary in the past to head each paragraph with a transcription of the contributor's label. In some cases the name of the species was unknown to the contributor so that he wrote on his labels (say) "*Ranunculus* sp.": in other cases his naming was incorrect. In each case probably the correct name was given later in the paragraph in the Referee's comment. The Publications Sub-Committee are of opinion that this procedure was wrong and that each paragraph should be headed by the correct name of the gathering contributed.

I have given effect to this in the present Report by printing the correct name first and where a change has been necessary this is indicated by printing in inverted commas within square brackets the name under which the gathering was submitted.

Secondly, no reference has been made to several gatherings, either because Referees' notes on them were not available in the case of a few critical gatherings or because they were gatherings of uncritical plants from localities which did not extend the known distribution.

The thanks of the Club are due to all those who have contributed notes and to all those Referees who assisted by examining parcels. Thanks are also due to Mr Chapple for having carried out the Distribution and for his share in this Report and especially for the very interesting set of Elms which he contributed. I saw him in the summer of 1940 when his battery formed part of the A.A. defences of this area. He was then a sergeant but I understand that he has since been posted to an O.C.T.U. and has no doubt by now gained his Commission.

PATRICK M. HALL.

Fareham, Hants,
February 22nd, 1941.

LIST OF PARCELS RECEIVED.

	Sheets.	Gatherings.
G. M. Ash	31	2
E. B. Bishop	24	3
G. C. Brown	74	6
Druce Herbarium, Univ. of Oxford, per J. F. G. Chapple	448	26
E. S. Edees	47	4
J. D. Grose	160	14
P. M. Hall	77	7
J. W. Long	130	9
R. Melville	54	4
National Museum of Wales	64	6
Nottingham Natural History Museum ...	192	19
F. Rilstone	118	9
Miss C. M. Rob	121	11
E. C. Wallace	200	15
Total ...	1740	135

Fumaria officinalis L. ["*Fumaria* ——."] 61, S.E. Yorks.: cliff tops—arable land, Atwick, July 13th, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM. "This is typical *F. officinalis* L."—H. W. PUGSLEY.

Rorippa austriaca (Crantz) Bess. ["*Nasturtium austriacum* Crantz."] 41, Glamorgan; in abundance on cultivated ground near Grangetown, Cardiff, June, 1938.—Coll. R. L. SMITH and A. E. WADE; comm. DEPARTMENT OF BOTANY, NATIONAL MUSEUM OF WALES.

Barbarea verna (L.) Aschers. (Ref. No. 3828.) 23, Oxon.; garden weed, Headington, May 8th, 1938.—J. F. G. CHAPPLE. "Correct."—A. B. JACKSON.

Barbarea intermedia Boreau. (Ref. No. 3814.) 24, Bucks.; roadside, Piddington, April 14th, 1938.—J. F. G. CHAPPLE. "Yes, quite characteristic."—A. B. JACKSON.

Erophila Boerhaavii (Van Hall) Dumortier. ? 7, Wilts.; Minety station, April 6th, 1938.—J. D. GROSE. "These plants were collected on the platform of Minety station, and are, I think, a uniform gathering of the only form in the immediate neighbourhood. Marshall (*Journ. Bot.*, 1904) recorded "*Erophila praecox.* Stony platform, Minety station, in plenty." Specimens are in Herb. Druce, and agree well with those now distributed. According to Rouy, *Fl. de France*, 2, 227. *E. praecox* has "feuilles . . . à poils la plupart bifides, quelques-uns simples." Schultz in his recent monograph, however, describes *E. praecox* as having the hairs mostly simple, with only a few bifurcate. From his key these plants seem to come under *E. Boerhaavii* (Van Hall) Dum., as most of the hairs are forked; but Schultz himself has examined Marshall's plants and named them *E. praecox* (Stev.) DC. var. *virescens* (Jord.) O. E. Schultz."—J. D. G.

Viola canina L. var. *ericetorum* Reichb. × *Riviniana* Reichb. ["*Viola Riviniana* Reichb. var. *flavicornis* (Forster)."] (Ref. No. 2529.) 19. N. Essex; short turf in Deer Park, Markshall, May 8th and Sept. 11th, 1938; flower pale blue, spur yellow, all plants small and remaining so in the fruiting stage of September 11th.—G. C. BROWN. "There is a mixture here. The flowering plants of May 8th are nearly all *V. canina* L. var. *ericetorum* (Hayne) Reichb. (= *V. flavicornis* Sm. *non* Forster) × *Riviniana* Reichb. There may be amongst them a few scraps of the *canina* parent, the influence of which is seen in the hybrids in their habit and stipules. No doubt at the time of Mr Brown's first visit on May 8th the *Riviniana* plants were past flowering and the *canina* barely yet in flower, so that the hybrids would be conspicuous and consequently gathered. The fruiting plants all belong to a small form of *V. Riviniana* Reichb. On Sept. 11th these would be the most conspicuous, as the hybrid plants would be sterile and the *canina* would very likely be less frequent."—P. M. HALL.

Viola segetalis Jord. forma *obtusifolia* (Jord.) Drabble. [" *Viola agrestis* Jord."] (Ref. No. 2527.) 19, N. Essex; field by Oliver's Thicks, Stanway, July 10th, 1938; upper petals pale blue outside and in.—G. C. Brown. " This gathering would probably come under *V. agrestis* Jord. according to the late Dr Drabble's classification but it is becoming increasingly evident to me that the numerous ' species ' in that classification overlap to a great extent. This gathering appears to me to consist of young plants of *V. segetalis* Jord. f. *obtusifolia* (Jord.) Drabble. Under a tall covering crop the branches would tend to become erect and so show the habit characteristic of *segetalis*. It is useful to know the cropping of the field in which such gatherings are made."—P. M. Hall.

Viola segetalis Jord. forma *obtusifolia* (Jord.) Drabble. [" *Viola* ——."] 56, Notts.; waste ground, Arnold Road, Nottingham, September, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum. " See my remarks on Mr Brown's gathering. I find that plants which agree with *V. agrestis* Jord. in Drabble's classification are almost invariably autumnal or ' stubble ' growths."—P. M. Hall.

Viola ruralis Bor. (det. P. M. Hall). 62, N.E. Yorks.; clover field, Catton, May 9th, 1938.—Miss C. M. Rob. " A very uniform gathering, of which Miss Rob kindly sent me fresh specimens. I have no doubt that this is the same plant as that distributed by Miss Rob in 1936, see *B.E.C. 1936 Rep.*, 395 (1937). That gathering, which was very immature, appeared to resemble *V. Deseglisei* Jord. and was so named by me, illustrating the undesirability of naming any but mature gatherings in this group."—P. M. Hall.

Silene gallica L. (Ref. No. Ran. 1252.) 1a, Scilly; St Mary's, June 5th, 1938.—Coll. J. E. S. Dallas; comm. E. B. Bishop. " These plants were shown growing to the collector by Mr J. E. Lousley, who pointed out the great difference in flowers between this and *S. anglica* (restr.), which grew plentifully in the district. Although Davey, in *Fl. Cornwall*, did not record *S. gallica* (restr.) for the county, it is evident that he included all references under an aggregate *S. anglica*. Mr Lousley informs me that *S. gallica* (restr.) has been well known to occur in the Isles of Scilly for many years. However it does not appear to have been distributed previously from there through the B.E.C."—E. B. Bishop. " This appears to be *S. gallica* L. *sensu* J. Cosmo Melvill in *Journ. Bot.*, *18*, 146 (1880). No notes, however, are given about the colour of the petals. This should always be done by collectors for this section of *Silene*. The best taxonomic value to be assigned to the plants showing various character combinations in this group (*Silene anglica sens. lat.*) is at present uncertain."—W. B. Turrill.

Spergularia rubra (L.) J. & C. Presl. 56, Notts.; paths, Wollaton Hall, Nottingham, June 23rd, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum. " Correctly determined."—W. B. Turrill.

Erodium neglectum Baker and Salmon. [" *Erodium cicutarium* L'Hérit. ? var. *glutinosum* (Dum.)."] 61, S.E. Yorks.; Hornsea sands, July 14th, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM. "This agrees with *E. neglectum* Baker and Salmon but I am not yet [5/2/40.—ED.] sure whether this species is valid nor whether it may not contain more than one element."—E. F. WARBURG. [Not sent out till 1939 Distribution.—ED.]

Trifolium agrarium L. 41, Glamorgan; field, Whitchurch, July, 1938. —Comm. DEPARTMENT OF BOTANY, NATIONAL MUSEUM OF WALES.

Rubus ramosus Briggs. 1, W. Cornwall; Ventongimps, Perranzabuloe, August 26th, 1938.—F. RILSTONE. "Yes."—W. WATSON.

Rubus Winteri P. J. Muell. *apud* Wirtg. (det. Wm. Watson). [" *Rubus Winteri* Focke."] 56, Notts.; Gold Holes Lane, near Everton, August 26th, 1932.—Coll. H. FISHER; comm. NOTTINGHAM NATURAL HISTORY MUSEUM.

Rubus propinquus P. J. Muell. [" *Rubus* sp. near *R. macrostemon* Focke."] 1, W. Cornwall; Ventongimps, Perranzabuloe, Aug. 26th, 1938.—F. RILSTONE. "This plant, which has been under observation since 1924 as a form near *R. macrostemon*, is now sent because it almost exactly matches a gathering from Kaiserlautern in the Bavarian Palatinate distributed as '*R. procerus* P. J. M. var. *robustus* P. J. M.=var. *dynatos* Focke.' Focke (*Species Ruborum*, 1914) arranges *procerus*, *macrostemon*, and *dynatos* (=*robustus*) as subspecies under *R. hedycarpus* Focke. Kaiserlautern is little more than thirty miles from Weissenburg, where P. J. Mueller lived, but Rev. H. J. Riddelsdell, who has seen authentic specimens of Mueller's *robustus*, told me some time ago that it is very near another plentiful plant of this neighbourhood—a plant of stouter growth with broader panicle and different leaves—so this now sent must be rather a form allied to *robustus* than actually it. Whatever the most suitable name there is no doubt of the very substantial agreement of the British and German plants. The only differences I can find are the rather greater amount of spreading hair on the petioles and the narrower bases of the panicle leaves on the German plant. I append a description of the plant now sent:—Stem dull purplish above with shallow furrows and prominent rounded ridges along the angles, a good deal of stellate pubescence (sometimes disappearing from the older stems) and a few longer hairs. Prickles confined to the angles, straight, declining. Petioles with hooked prickles and loosely adpressed hair. Leaflets white felted beneath with veins sunk on the upper surface and prominent beneath. Terminal leaflet elliptic, roundish-ovate, or roundish-obovate, two to three times as long as its stalk. Panicle usually cylindrical with more or less patent branches above and strongly ascending ones below and with 3-nate and simple leaves. Rachis rather wavy, clothed with dirty-whitish-grey hair and felt (the hair spreading and loosely adpressed) and with declining prickles, slender in the upper portion and stouter below. Panicle branches dividing above the middle into three or more branchlets. Sepals short and broad, very concave, short pointed, with plenty of hair and felt; patent on fall of petals, reflexed later. Petals pinkish, concave, crumpled, rather narrowly oval, well apart. Stamens long, white, later forming a shaggy mass about the young fruit."—F. Rilstone. "This is *Rubus propinquus* P. J. Muell. I have seen it in several counties from Kerry to Kent, and it is reported from many places in the N.W., W., and the centre of France. There is no description of it in the 'Handbook.' The Discolores are divided into (1) the *Gypscaulones*, of which *R. Winteri* and *R. ulmifolius* are representative, and (2) the *Hedycarpi*, of which the cultivated *R. procerus* is an example. *R. propinquus*, by reason of its pruinose stem, belongs to the former group: its affinity with the *Hedycarpi* is more remote."—Wm. Watson.

Rubus effeminatus (Focke). ["*Rubus criniger* Linton."] 19, N. Essex; Layer-de-la-Haye Common, July 10th, 1938.—G. C. Brown. "Petals white, stamens exceeding styles, sepals reflexed in flower and later. Apparently identical with numerous gatherings seen from the Colchester district by Moyle Rogers and Riddelsdell including Ref. No. 1986 from Grime's Dyke, Stanway, *cf. B.E.C. 1923 Rep.*, 384 (1924). The cuneate-based leaflets are very constant in this gathering as well as the greyish appearance of the living bush."—G. C. Brown. "Not *R. criniger*, which has 4-nate and 5-nate pedate as well as 3-nate leaves on the stem, and an ovate-acuminate ± lobate (not an obovate) terminal leaflet, besides a differently constructed panicle. In my opinion it is *R. effeminatus* (Focke). In 1931 I identified Mr Brown's Ref. No. 1986 from Stanway as this in Hb. Druce. Focke merely gives, under *Rubus egregius*, in *Rubi Europaei*, p. 183 (1914), 'Forma: *effeminatus* Focke nov. nom.: molliter pilosus; inflorescentiae extraaxillares longae, multiflorae; sepala longe acuminata, in flore patentia, in fructu reflexa; stamina stylis multo breviora.—Fruticem vidi unicum haud procul ab Oxford Britanniae.' Druce gives *R. egregius* forma *effeminatus* Focke for Boar's Hill on Focke's authority in 'Additions to the Berkshire Flora,' p. 454 (? 1918). There is no specimen of it from Boar's Hill in Hb. Druce, but he says in *Fl. Berks.* that he took Focke to the top of Boar's Hill in 1894, and that Focke found *R. sulcatus* there. I know where *R. sulcatus* grows at Boar's Hill, and not very far to the south of it I found a bush of *R. effeminatus* in a hedge of birches in 1933. I do not suggest that my bush is the one that Focke found, but I do not know of it elsewhere at Boar's Hill. On the northern slope of the hill there is a bush of typical *R. egregius* Focke, in the open, which Druce records as *R. mercicus* var. *bracteatus* Bagn. (a later synonym of *R. egregius*). This could never be described as 'molliter pilosus,' and had this bush been intended Druce, who says he had known it since 1889, must surely have made some reference to it in recording the *effeminatus*. In my specimen of *effeminatus* and in the Essex specimens the stem is acute-angled and glaucous, the leaves are very rarely 4-nate and never apparently 5-nate, only slightly greyish beneath, the terminal leaflet is narrow obovate-cuneate with undulate margin and irregular acuminate teeth, the petals are pink (see the unclosing petals under a lens!) and the carpels are pilose. The whole plant is softly pilose. This will distinguish *R. effeminatus* from *R. egregius*."—WM. WATSON.

Rubus Schleicheri Weihe (det. Wm. Watson). ["*Rubus Murrayi* Sudre."] 56, Notts.; Whip Ridding, Kirklington, July 21st, 1938.—Coll. H. FISHER; comm. NOTTINGHAM NATURAL HISTORY MUSEUM.

Potentilla intermedia L. 41, Glamorgan; in some quantity on cultivated ground near Grangetown, Cardiff, June, 1938.—Coll. A. E. WADE and R. L. SMITH; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES. "Correct."—D. H. VALENTINE.

Sorbus intermedia (Ehrh.) Pers. 62, N.E. Yorks; lane near Sunbeck Junction, Raskelf, June 17th, 1938.—Miss C. M. ROB. "Correct."—E. F. WARBURG. [Not sent out until 1939 Distribution.—ED.]

Ribes alpinum L. (Ref. No. 3122.) 7, N. Wilts.; Wick Hill, May 4th, 1938; abundant in this station, where it cannot be native but was perhaps introduced accidentally when conifers were planted nearby; all the bushes noticed are male.—J. D. GROSE.

Epilobium hirsutum L. × *Lamyi* F. Schultz. 17, Surrey; gravel pits, Farnham, July 31st, 1938.—G. M. ASH.

Epilobium adenocaulon Hausskn. × *montanum* L. 17, Surrey; brickworks near Chiddingfold, Aug. 6th, 1938.—G. M. ASH.

Blumenbachia insignis Schrad. (Ref. No. 38339.) 23, Oxon.; tip, Jack Daw Lane, Nov. 9th, 1938.—J. F. G. CHAPPLE and J. P. M. BRENAN.

Carum Petroselinum (L.) Benth. & Hook. 54, S. Lincs.; sand-hills, Sutton-on-Sea, June 26th, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM.

Galium saxatile L. ["*G. hercynicum* Weig. forma."] (Ref. No. 3889.) 59, S. Lancs.; near Hutton Cross, near Preston, June 23rd and July 9th, 1938.—Coll. H. E. BUNKER; comm. J. F. G. CHAPPLE (see *B.E.C. 1936 Rep.*, 450 (1937)).

Galium tricorne Stokes. 61, S.E. Yorks.; cliff cornfield, Atwick, July 17th, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM. "Yes."—C. E. BRITTON.

Galium Vaillantii DC. 39, Staffs.; allotments, Burton-on-Trent, Aug. 31st, 1938.—J. F. G. CHAPPLE. "Yes."—C. E. BRITTON.

Valerianella dentata (L.) Poll. 56, Notts.; Cinderhill, June, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum.

Valerianella carinata Loisel. (Ref. No. 3843.) 3, S. Devon; garden-weed, Priory Avenue, Kingskerswell, June 13th, 1938.—J. F. G. Chapple.

Chrysanthemum Balsamita L. 56, Notts.; old kitchen garden, Wollaton Hall, Nottingham, Sept., 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum.

Senecio vulgaris L. var. *radiatus* Koch. 17, Surrey; gravel pits, Ham, April 1st, 1938.—Coll. F. M. Struthers; comm. E. C. Wallace.

Arctium vulgare (Hill) Evans. 1, W. Cornwall; Lambourne Hill, Perranzabuloe, Aug. 25th, 1938, and seeds, Oct. 29th, 1938. This appears to belong to the form (A), *vulgare* proper (Evans, *Journal of Botany*, 1937, p. 77), which Dr Evans says is the prevailing form along the western seaboard. The petioles in this locality almost always show in section the seven main strands as figured by Butcher and Strudwick. As usual in this neighbourhood the plants were heavily infected with the parasitic fungus *Erysiphe cichoriacearum* which made it difficult to preserve colour in drying.—F. Rilstone. "The specimens were probably all *A. vulgare* (Hill) Evans; one certainly was."—A. H. Evans.

Carduus tenuiflorus Curt. [" *Carduus pycnocephalus* L. var. *tenuiflorus* (Curt.)."] 41, Glamorgan; on sand and shingle, Sully Island, June, 1938.—Coll. A. E. Wade; comm. Dept. of Botany, National Museum of Wales.

Crepis biennis L. 62, N.E. Yorks.; between Topcliffe village and station, June 22nd, 1938.—Miss C. M. Rob. "Beautiful material."—J E. Lousley.

Taraxacum lacistophyllum Dahlst. [" *Taraxacum* ——."] 65, N.W. Yorks.; roadside Burrill, near Bedale, May 15th, 1938.—Miss C. M. Rob. "The speeimen (*sic.*—Ed.) of *Taraxacum*, which you (=J.F.G.C. ?—Ed.) kindly sent me, is *T. lacistophyllum* Dahlst. (the group of *Erythrosperma*)."—G. Haglund.

Symphytum officinale L. ["*S. officinale* L. × > *peregrinum* Ledeb.?"] 34, W. Gloster.; Oakford Valley, June 18th, 1938; apart from the slightly less decurrent lower leaves, and the longer filaments, there is little in these dried specimens to distinguish them from *S. officinale*; when growing, however, the plants appeared, particularly in the colouring of the flowers and leaves, to be truly intermediate between the suggested parents.—J. D. Grose. "I fail to find evidence of hybridity; the clothing of hairs, the shape of the leaves, which also overtop the inflorescence, and the very definitely decurrent leaves, are all characteristic of *S. officinale*."—A. E. Wade.

Myosotis scorpioides L. em. Hill var. *memor* Kittel mixed with *M. caespitosa* Schultz. [" *M. palustris* Hill var. *strigulosa* (Reichb.)."] 61, S.E. Yorks.; Hornsea Mere, July 19th, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum. " This gathering is a mixture of *M. caespitosa* Schultz and the upper portion of *M. scorpioides* L. em. Hill which appears to come under the typical form, i.e., var. *memor* Kittel. Reichenbach's *strigulosa* is not based upon the single character of adpressed hairs; see *B.E.C. 1929 Rep.*, 162 (1930). The majority of the records published for *M. scorpioides* var. *strigulosa* (Reichb.) Schinz & Keller are errors for either other forms or varieties of *M. scorpioides* or for *M. caespitosa*, and should be rejected unless recently confirmed."—A. E. Wade.

Cuscuta europaea L. 31, Hunts.; found growing on Hops, Nettles, and *Acer campestre* in a roadside hedgerow near the village of Upton, Aug. 9th, 1938.—R. Melville. [This gathering of *Cuscuta* and those that follow were submitted to the referee, Dr W. A. Clark of Newcastle upon Tyne, who states that his notes upon them were returned to Mr Chapple before Easter 1939: unfortunately they were not among the papers forwarded to me from Yardley Lodge and have not come to light since.—Ed.]

Cuscuta Trifolii Bab. (probably). (Ref. No. Eri. 504). 32, Northants; Old Stone Pits, Ufford (parasitic on *Genista tinctoria*), Aug. 26th, 1937. —Coll. Mrs C. L. Wilde; comm. E. B. Bishop. " At this particular station seemingly almost confined to one host-plant, which grows rather freely in a largish long-abandoned pit, where no plough could possibly be used. The plants, both host and parasite, have been under our notice since 1933, and we have never seen the parasite in the large field surrounding the pit, though no wall or fence intervenes. Rotation crops of *Medicago sativa*, *Onobrychis* and clovers are grown at intervals and (as usual) persist in plenty on the edges, often up to the spots where the *Genista* grows, but the *Cuscuta* seems to ignore them."—E. B. Bishop.

Linaria repens (L.) Mill. 10, Wight; hedgebank, Cowes, August, 1938.—J. W. Long.

Veronica agrestis L. var. *Garckiana* P. Fourn. [" *V. agrestis* L."] (Ref. No. 38181.) 39, Staffs.; allotment ground, Burton-on-Trent, Aug. 31st, 1938.—J. F. G. Chapple. " Yes, good specimens of the var. *Garckiana* P. Fournier."—J. E. Lousley.

Euphrasia borealis Towns. (Ref. No. 1164.) 39, Staffs.; Stanton, July 15th, 1938.—E. S. Edees. " Good specimens of typical *E. borealis*." —H. W. Pugsley.

Euphrasia Pseudo-kerneri Pugsl. forma *elongata* Pugsl. [" *E. nemorosa* (Pers.) Löhr."] 28, W. Norfolk; Narborough, Aug. 8th, 1938,

E. S. Edees. "This is *E. Pseudo-kerneri* f. *elongata* Pugsl., which is known for several stations in Norfolk. It usually produces white flowers. In most of the specimens the corolla has shrivelled in drying through insufficient pressure."—H. W. Pugsley.

Euphrasia nemorosa Löhr var. *collina* Pugsl. (det. H. W. Pugsley). (Ref. No. 3117.) 62, N.E. Yorks.; exposed grassy ground on cliffs about 3 miles north of Whitby, July 6th, 1938.—P. M. Hall.

Euphrasia confusa Pugsl. forma *albida* Pugsl. [" *Euphrasia* ——."] (Ref. No. 1163.) 57, Derby; near Baslow, July 30th, 1938.—E. S. Edees. "Is *E. confusa* f. *albida* Pugsl. Many of the specimens are unbranched like the form frequently seen in Scotland."—H. W. Pugsley.

Orobanche Rapum-genistae Thuill. 10, Wight; on *Ulex*, Lynn Common, July, 1937.—J. W. Long. "Rightly named. This is now a rare species and it is doubtful whether twenty-six specimens should have been collected. Orobanches (except *O. minor*) are too easily exterminated."—H. W. Pugsley.

Mentha longifolia (L.) Huds. 17, Surrey; roadside near Bullswater Common, Aug. 27th, 1938.—Lady Davy and Miss C. M. Rob. "The short, tapering leaves bring this very near to var. *pulverulenta* Strail. The plant is less robust than the Farningham form, and the leaves not quite as broad in relation to length. Possibly habitat is responsible."—A. L. Still.

Mentha longifolia (L.) Huds. 13, W. Sussex; roadside, North Stoke, Aug. 7th, 1938.—E. C. Wallace. "The suddenly-rounded apices of the lower leaves and the venation raise some suspicion of hybridity. The presence of epigeal stolons is evidence of *rotundifolia*, and should be looked for in doubtful cases. The early date of flowering rather indicates *longifolia*; most of the hybrids I have seen have not flowered till after mid-August."—A. L. Still.

Mentha verticillata L. 66, Durham; Winch Bridge, Sept. 3rd, 1938.—Miss C. M. Rob. "Correct."—A. L. Still.

×*Mentha Muelleriana* F. Schultz var. *serratifolia* Pugsl. 17, Surrey; cult. Wallington from a Salcombe cutting, Aug. 15th, 1938.—Coll. A. L. Still; comm. E. C. Wallace.

Ajuga Chamaepitys (L.) Schreb. (Ref. No. 3324.) 12, N. Hants.; bare arable field, Harewood, near Andover, Sept. 13th, 1938; this species was very plentiful in this locality this year and the plants were so large that it was impossible in most cases to dry whole plants; members may be glad to see such luxuriant fruiting specimens.—P. M. Hall.

Chenopodium hybridum L. (Ref. No. 38293.) 23, Oxon.; waste ground, Lamarsh Road, Oxford, Oct. 13th, 1938.—J. F. G. CHAPPLE. " Correct."—A. J. WILMOTT.

Chenopodium opulifolium Schrad. (Ref. No. 38294.) 23, Oxon.; waste ground, Binsey Lane, Oxford, Oct. 13th, 1938.—J. F. G. CHAPPLE. " Correct."—A. J. WILMOTT.

Chenopodium polyspermum L. (det. E. C. Wallace). 56, Notts.; waste ground, Derby Road, Nottingham, August, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM.

Atriplex tatarica L. 10, Wight; riverside, Newport, August and September, 1937; the plant, which was named by Dr Aellen, was destroyed before it reached maturity and I had difficulty in finding any fruit.—J. W. LONG. " Correct."—A. J. WILMOTT.

Rumex maritimus L. 28, W. Norfolk; in various stages of growth on the sandy margin of Ringmere, near Thetford, Aug. 14th, 1938.—J. E. LOUSLEY and E. C. WALLACE.

Euphorbia exigua L. [" *E. exigua* L. var. *retusa* DC."] 56, Notts.; near Rushcliffe Halt, Sept. 24th, 1938.—Coll. R. BULLEY; comm. NOTTINGHAM NATURAL HISTORY MUSEUM. " The specimen before me is *not* the variety, as it has the leaves acute, not retuse."—A. J. WILMOTT.

Ulmus glabra Huds. var. *montana* Lindquist. (Ref. No. 3768.) 23, Oxon.; West Bar Street, Banbury, May 19th and Sept. 14th, 1938.—J. F. G. CHAPPLE. " This is very close to Lindquist's variety as illustrated in plate 15, *B.E.C. 1931 Rep.* The shape of the leaf, serrations, short petioles and rather slender branchlets are all similar. Forms similar to this occur sporadically in England and it is doubtful whether they are actually varieties or of hybrid origin. The tree from which this gathering was taken is growing very near to *U. Plotii*, No. 3763, and the following characters suggest the possibility of hybridisation with the latter species: the distal leaves of the short shoots often have very broad, blunt serrations and not infrequently the leaf base is subcordate. Unless additional new characters are discovered, this question can be settled only by breeding experiments."—R. MELVILLE.

Ulmus glabra Huds. × *nitens* Moench var. *Hunnybunii* Moss. [" *U. sativa* Moss ?"] (Ref. No. 2528.) 19, N. Essex; hedge, Gamon's Farm, Wormingford, May 22nd and Sept. 4th, 1938; mostly young trees extending the whole length of a field and uniform in type but none in fruit; seems best under *U. Plotii* Druce = *sativa* Moss, but the leaves are extremely long and narrow, almost as in *U. stricta*.—G. C. BROWN. " Probably *Ulmus nitens* var. *Hunnybunii* Moss × *U. glabra* Huds. The leaf shape is very close to that of var. *Hunnybunii*, but the long sides of the subdistal leaves of the short shoots have about 15 lateral veins instead of 10, the finer veinlets are sunk in the surface giving it a coarse grained appearance and the petioles are shorter. All these characters indicate *U. glabra* as one parent."—R. MELVILLE.

Ulmus glabra Huds. × *Plotii* Druce. (Ref. No. 3639.) 23, Oxon.; roadside near Sturdy's Castle; flowers February, 1937; fruit May 13th, 1938; foliage June 6th, 1937, and Sept. 14th, 1938.—J. F. G. CHAPPLE. "This hybrid fits very well into the large range of hybrid forms of this parentage, many of which have been found further north where *U. Plotii* is more common. Characters derived from *U. glabra* are the rather coarse leaves with somewhat acute serrations and rather numerous lateral veins, averaging 13 for the subdistal leaves of the short shoots as compared with 8 in *U. Plotii*. The rufous hairs on the bud scales also come from *U. glabra*. The characters of *U. Plotii* are not well marked, but the smaller size of the leaves and the rather uniformly cordate bases of the basal leaves of the short shoots and rather slender pendulous branchlets can be attributed to this source."—R. MELVILLE.

Ulmus glabra Huds. × *U.* sp. [" ×*U. hollandica* Miller = *U. major* Sm."] (Ref. No. 2533.) 19, N. Essex; Little Horkesley, Sept. 9th, 1938; very tall trees with very slender pendulous branches, leaves shining above and markedly unequilateral.—G. C. BROWN. " Not ×*Ulmus hollandica* Mill. This is a hybrid of *U. glabra* Huds. probably with one of the East Anglian small-leaved elms related to *U. Plotii* Druce but not yet named. Distal leaves on some of the short shoots are cordate-based and the leaf shape sometimes approaches that of *U. Plotii*. The long shoots tend to continue growth, successive leaves changing in shape, shortening and becoming blunter toothed and more equal at the base, another feature of *U. Plotii* and its allies. Several of the sheets have only long shoots; the more characteristic short shoots should always be included."—R. MELVILLE.

Ulmus carpinifolia Gleditsch. (Ref. No. 36. 21.) 20, Herts.; Cottered Green, 40 ft. tree, flowers Feb. 28th, fruit May 3rd, leaves Aug. 18th, 1938.—R. MELVILLE. " The tree from which this gathering was taken was illustrated in the *Quarterly Journal of Forestry*, and is probably pure *U. carpinifolia*. Note the shape of the distal and subdistal leaves of the short shoots, especially the base, also the acute serrations, numerous glands and absence of scattered hairs; the fruits are obovate with a cuneate base."—R. MELVILLE.

Ulmus carpinifolia Gleditsch × *glabra* Huds. [" *U. carpinifolia* Borkh. = *U. glabra* Miller."] (Ref. No. 2532.) 19, N. Essex; large old tree, Bottingoms Farm, Wormingford, Sept. 4th, 1938; leaves shining above, twigs not pendulous; this seems to be a very characteristic *U. glabra* and the small quantity of fruit seen earlier in the season confirms this.—G. C. BROWN. " This is not pure *U. carpinifolia* Gleditsch (the oldest authority for the name) but shows evidence of a strain of

U. glabra in the larger size of the leaves and the intermediate leaf shape."—R. MELVILLE.

Ulmus carpinifolia Gleditsch × *Plotii* Druce. (Ref. No. 3775.) 23, Oxon.; roadside, Charlton-on-Otmoor, May 5th and Sept. 17th, 1938.—J. F. G. CHAPPLE. "The leaf shape in this hybrid is very close to that of *U. Plotii* and the serrations broad and blunt as in that species. The leaf base in many cases is subcordate and nearly equal as in *U. Plotii* but some of the leaves have the base strongly asymmetrical and of similar shape to *U. carpinifolia*. The influence of *U. carpinifolia* is also shown in the larger size of the leaves."—R. MELVILLE.

Ulmus carpinifolia Gleditsch × *Plotii* Druce. (Ref. No. 3776.) 23, Oxon.; roadside, Charlton-on-Otmoor, May 5th and Sept. 17th, 1938.—J. F. G. CHAPPLE. "This is probably a segregate of the parentage suggested. Notice that the distal and subdistal leaves of short shoots generally have the base similar in shape to that of *U. carpinifolia* while the shape of the upper half is intermediate or in some cases approaches to that of *U. Plotii.* The leaf-serrations are broader and blunter than in *U. carpinifolia,* approaching *U. Plotii* in this respect. The fruits are relatively longer and more elliptical than in *U. Plotii* and show some tendency to the cuneate base of *U. carpinifolia*.—R. MELVILLE.

Ulmus Plotii Druce. (Ref. No. 3763.) 23, Oxon.; West Bar Street, Banbury, March 4th and Sept. 14th, 1938.—J. F. G. CHAPPLE. "Typical Plot's elm. The tree in the foreground of the plate in *B.E.C. 1911 Rep.* may be regarded as the type tree, although Druce did not say in so many words that it was his type or mention any special tree as his type. This gathering is from the second large tree to be seen in the picture, behind and appearing slightly to the left of the first."—R. MELVILLE.

Ulmus Plotii Druce. (Ref. No. 3834.) 38, Warwick; Bridge End, Warwick, March 4th, May 17th, and Sept. 14th, 1938.—J. F. G. CHAPPLE. "Good typical material of Plot's Elm."—R. MELVILLE.

Ulmus stricta Lindl. var. *Goodyeri* Melville. (Ref. No. 38. 6.) 11, S. Hants.; tree, 25 ft., near Bashley, Mar. 6th, May 25th, and Aug. 12th, 1938.—R. MELVILLE. "Gales caused severe damage to the foliage before it was fully expanded and this resulted in the production of numerous proleptic shoots to replace that destroyed. The leaves of such shoots are much narrower than those of normal foliage and are also roughly hairy. When this variety was described (*Journ. Bot.*, July, 1938) it was pointed out that Goodyer must have drawn up his description from young plants that would have had narrow rough leaves. If the trees had suffered in the same way in 1624, he would have been impressed by the narrowness and roughness of the leaves of mature trees as well as of young plants. It was very difficult this year to find any undamaged normal foliage on the trees."—R. MELVILLE.

Salix Caprea L. (Ref. No. 3084.) 7, N. Wilts.; Okus Quarry, Swindon, April 4th and Aug. 8th, 1938.—J. D. Grose. "Correct."—A. J. Wilmott. "*S. atrocinerea* × *Caprea*: reddish hairs can be seen on the upper surfaces of some of the younger leaves and the leaf-shape is longer and more acute than in typical *S. Caprea*; note also the rather long style; probably older branches would show some striations on the wood."—R. Melville. "After seeing Melville's determination, I have re-examined my specimen and still see no signs of *S. atrocinerea* in it."—A. J. Wilmott.

Salix Caprea L. (Ref. No. 3097.) 8, S. Wilts.; Little Bedwyn, April 10th and July 24th, 1938; conspicuous when fresh by the bright orange (not yellow) anthers; the shoots are slightly leafy.—J. D. Grose. "Yes."—A. J. Wilmott and R. Melville.

Salix Caprea L. × *viminalis* L. ["*S. viminalis* L. × ?"] (Ref. No. 3088.) 7, N. Wilts.; Inglesham, April 5th and June 9th, 1938.—J. D. Grose. (For the use of the referee I am including a single sheet showing material collected from the same tree in 1937—Ref. No. 2193. These much larger, silkier leaves were from a lower branch, and are not typical of the upper ones. The swamp was quite dry in 1938, thus perhaps accounting for the smallness of the leaves. All were very badly eaten, and it was difficult to find any worth collecting.—J.D.G.) "*S. Caprea* × *viminalis*, I think."—A. J. Wilmott. "*S. viminalis* × *Caprea*, I think. An older branch should have been stripped of bark to make sure that there are no striations on the wood."—R. Melville.

Salix atrocinerea Brot. ♀ (Ref. No. 381.) 1, W. Cornwall; bank by stream, Lambiggan, Perranzabuloe, April 13th and July 21st, 1938.—F. Rilstone. "Correct."—A. J. Wilmott. "*S. atrocinerea* × *aurita* segregate approaching *S. atrocinerea*. Evidence of *S. aurita* is given by the distinctly toothed, sometimes undulate and ± inrolled leaf-margins and some of the ovaries with sessile, short, blunt-lobed stigmas. The striations on the wood are more numerous than is usual for *S. atrocinerea*."—R. Melville.

Salix atrocinerea Brot. ♀. 1, W. Cornwall; by stream, Lambourne, Perranzabuloe, May 9th and Sept. 8th, 1938.—F. Rilstone. "Correct."—A. J. Wilmott and R. Melville.

Salix atrocinerea Brot. (Ref. No. 3088.) 7, N. Wilts.; Inglesham, April 5th and June 9th, 1938.—J. D. Grose. "Correct."—A. J. Wilmott and R. Melville.

Salix atrocinerea Brot. × *aurita* L. ? hermaphroditic. (Ref. No. 3128). 7, N. Wilts.; near Lydiard Plain, May 7th and Aug. 8th, 1938.—J. D. Grose. "But for the smallness of the ♂ catkins I should have passed this as *S. atrocinerea*, but because of them I think it is probably a hybrid."—A. J. Wilmott. "*S. aurita* L. forma."—R. Melville.

Salix atrocinerea Brot. × *viminalis* L. (Ref. No. 37. 22.) 21, Middlesex; Thames bank, Twickenham, April 1st 1938; the most obvious characters of *S. atrocinerea* are the striated wood of two year or older stems and the reddish-brown hairs on the leaves; the latter are more apparent when the leaves are full-grown.—R. MELVILLE. "Yes, but the mature leaves should also be distributed with the flowers."—A. J. WILMOTT.

Populus tremula L. var. *sericea* Döll. (Ref. No. 3111.) 8, Wilts.; Green Lane Wood, April 20th and June 29th, 1938.—J. D. GROSE. "Foliage collected too late in the season to show the silky pubescence characteristic of this variety, which appears to be as common as or perhaps commoner than the typical form in the wild state."—A. B. JACKSON.

Populus nigra L. var. *genuina* Wesmael (det. A. B. Jackson). (Ref. No. 3082.) 7, N. Wilts.; damp field near Wanborough, March 31st. June 6th and August 13th, 1938.—J. D. GROSE. "This is the typical form of the European Black Poplar, distinguished by its glabrous young branchlets. It has a more easterly distribution than the var. *betulifolia*, which is the only form found wild in Britain. The material is very well selected and its value is increased by the addition of a photograph, which shows the habit of the tree."—A. B. JACKSON.

Ceratophyllum submersum L. 36, Hereford; pond near Tyberton, Aug. 21st, 1938; a very interesting find by Mr P. M. Hall and myself of a species that is, I believe, usually found near the sea in ditches influenced by the tides; fruits were scarce, but well-developed.—E. C. WALLACE.

Stratiotes aloïdes L. 50, Denbigh; abundant in a pool, Gresford, August, 1938.—Coll. W. E. JONES; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Iris Pseudacorus L. var. *Bastardi* (Bor.). 17, Surrey; pond on Epsom Common, June 10th, 1938.—E. C. WALLACE.

Allium roseum L. var. *bulbiferum* Kunth. 41, Glamorgan; Barry, June, 1938.—Coll. R. L. SMITH; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Luzula Forsteri (Sm.) DC. × *pilosa* (L.) Willd. = × *L. Borreri* Bromf. (Ref. No. 2299.) 11, S. Hants.; with both parents, Mislingford, near Wickham, May 7th, 1938.—P. M. HALL.

Lemna minor L. 15, E. Kent; dyke near the sea, Seasalter, Sept. 23rd, 1938; this is a form which I have always seen near the sea, differing from the plant of inland pools and streams by its larger size and greater thickness.—E. C. WALLACE.

Wolffia arrhiza (L.) Wimm. 17, Surrey; pond on Burgh Heath, Sept. 10th, 1938.—E. C. WALLACE.

Potamogeton gramineus L. (det. J. E. Dandy). (Ref. No. 3086.) 28, W. Norfolk; Ringmere Pool, near Thetford, June 26th, 1938.—P. M. Hall. "A broad-leaved state of very shallow water."—J. E. Dandy.

Potamogeton Friesii Rupr. (Ref. No. 3871.) 23, Oxon.; canal at Wolvercote, July 1st, 1938.—J. F. G. Chapple.

Potamogeton pusillus L. (det. J. E. Dandy) (*P. panormitanus* Biv.-Bern.) 13, W. Sussex; ditch by R. Arun, South Stoke, Aug. 7th, 1938.—E. C. Wallace. [Not sent out until 1939 Distribution.—Ed.]

Potamogeton pusillus L. (det. J. E. Dandy). (Ref. No. 38131.) 23, Oxon.; gravel-pit near Cassington, July 26th, 1938.—J. F. G. Chapple.

Carex L. The gatherings were submitted to Mr E. Nelmes of Kew, who agreed with all the determinations. Mr Nelmes tells me that his comments were returned to Mr Chapple in July 1939. These unfortunately have not come to light and Mr Nelmes did not keep a copy. In three cases Mr Nelmes suggested changes of name.—Ed.

Carex Hostiana DC. × *lepidocarpa* Tausch (= × *C. Leutzii* Aschers. & Graebn.) (Ref. No. 38125.) 22, Berks.; alkaline bog, Cumnor, July 25th, 1938.—J. F. G. Chapple.

Carex Hostiana DC. × *lepidocarpa* Tausch (= × *C. Leutzii* Aschers. & Graebn.) 64, M.W. Yorks.; Ripon Parks, June 23rd, 1938.—Miss C. M. Rob. "Certainly a hybrid involving the first-named parent and a species of the *flava* group. I see nothing in the characters of the specimens against the second parent being *C. lepidocarpa* Tausch, as Miss Rob suggests."—J. E. Lousley.

Carex lepidocarpa Tausch. 64, M.W. Yorks.; Ripon Parks, June 23rd, 1938.—Miss C. M. Rob.

Carex irrigua Sm. ["*C. magellanica* Lam."] 88, Mid Perth; bogs above Invermeran, Glen Lyon, at *c.* 1100 ft., July 13th, 1938.—Coll. P. M. Hall, R. Mackechnie, W. A. Sledge, and E. C. Wallace; comm. E. C. Wallace. "It was with great satisfaction that we refound this plant this year in some abundance in Brebner's locality recorded in Buchanan White's *Flora of Perthshire*."—E. C. W. "Beautiful specimens of this rare species."—J. E. Lousley. "Mr Nelmes says it may not be a convenient occasion to change the name to *C. paupercula* Michx. but at least it should be changed to *C. irrigua* Sm, since *C. magellanica* Lam. is specifically distinct."—Ed.

Carex limosa Thuill. 75, Ayr; bog in Knockewart Hills at *c.* 700 ft., July 19th, 1938.—Coll. R. Mackechnie; comm. E. C. Wallace.

Carex Hudsonii Ar. Benn. ["*C. elata* All."] (Ref. No. 3015.) 13, W. Sussex; bank of R. Adur, near Partridge Green, June 12th, 1938.—P. M. HALL.

Carex Hudsonii Ar. Benn. 62, N.E. Yorks.; Pilmoor, May 17th, 1938.—Miss C. M. ROB. "Undoubted specimens of this species."—J. E. LOUSLEY.

Carex leporina L. var. *longibracteata* Peterm. 17, Surrey; Peasemarsh, July 23rd, 1938.—E. C. WALLACE. "Mr Wallace's specimens are representative of a very interesting variant of *C. leporina* L. which appears to be constant and restricted to a few localities. Similar specimens were distributed from Milford, Surrey (*B.E.C. 1927 Rep.*, 590, (1928)) when Mr I. A. Williams made some interesting observations. The variant differs from the usual form of the species in (1) the very congested panicle and habit, and (2) the constant presence of a long leafy bract. The Surrey plant now contributed is identical with the well-known plant of a number of commons near Malvern. I was shown this on Castlemorton Common by the late Mr R. F. Towndrow in 1933, when he pointed out that it was originally described as *C. Malvernensis* S. Gibson, *Phytologist*, *1*, 715-716, 1843. The same plant was collected near Malvern by T. Westcombe and described in *Phytologist*, *2*, 751 and 759, 1847, as *C. argyroglochin* Hornemann—which it is not. I have been unable to find a continental variety which exactly fits the British plant. Sonder (*Fl. Hamb.*, 489, 1851) describes a *C. leporina* var. *capitata* which is said to resemble *C. festiva* Dew. (*C. Macloviana* D'Urb.), which scarcely suggests the present variation, and also his failure to mention the presence of long bracts, and their absence in the plate cited by him (*Fl. Dan. t.* 2366) shows that he had a different plant in mind. Judging from quotations, Petermann's *C. longibracteata* was founded solely on the presence of a long leafy bract, but I have been unable to refer to his original description (*Anal. Pflzschl.*, 493, 1846). Leafy bracts of considerable length frequently occur on plants of normal habit, thus, for example, specimens which I gathered at Brookwood, Surrey, in 1931 have bracts 11 cm. long although the plants are tall and slender and quite unlike Mr Wallace's specimens. The Castlemorton plant was described by Syme as *C. ovalis* Good. var. *bracteata* in *English Botany*, ed. 3, *10*, 104, 1873, but this name cannot be transferred to *C. leporina* since there is an earlier var. *bracteata* of that species (Liebm., *Vidensk. Selsk. Skr. Kjobenh.*, *5*, ser. II, 264, 1861) which Kukenthal refers to *C. albolutescens* Schwein. It appears therefore that we have only Gibson's name for this very characteristic plant, and it may be called *C. leporina* L. var. **malvernensis** (Gibson) comb. nov."—J. E. LOUSLEY.

×*Carex axillaris* Good. 65, N.W. Yorks.; Carthorpe Moor, Aug. 31st, 1938.—Miss C. M. ROB. "Excellent specimens of the hybrid well-known as ×*C. axillaris* (Good.). Goodenough's name unfortunately appears to be invalid owing to the earlier publication of *C. axillaris* L., *Sp. Pl.*, ed. 2, 1382 (1763). The earliest valid name appears to be ×*C. Crepini* Torges in *Mitt. Thür. BV.* (N.F.), *3*, IV, 59 (1893)."—J. E. Lousley.

Carex Otrubae Podp. [" *C. vulpina* L."] (Ref. No. 2719.) 7, N. Wilts.; near Wootton Bassett, July 22nd, 1937.—J. D. Grose.

Carex Pairaei F. Schultz. 88, Mid Perth; hedgebank, Ballechin, near Ballinluig, July 17th, 1938; first discovered in 1937.—Coll. P. M. Hall, R. Mackechnie and E. C. Wallace; comm. E. C. Wallace.

Gramineae Lindl. All the gatherings were submitted to Mr C. E. Hubbard of Kew, by whom corrections in naming were made as necessary. His notes, like those of Mr Nelmes on *Carex*, are unfortunately missing.—Ed.

Digitaria sanguinalis (L.) Scop. [" *Panicum sanguinale* L."] 11, S. Hants.; reclaimed land, Southampton, Sept., 1937.—J. W. Long.

Anthoxanthum Puelii Lec. & Lam. (Ref. No. 38080.) 3, S. Devon; barley field, Milber Down, Newton Abbot, August, 1938.—Coll. T. Stephenson; comm. J. F. G. Chapple.

Agrostis tenuis Sibth. (Ref. No. 3118.) 62, N.E. Yorks.; bare open ground on cliffs about 3 miles north of Whitby, July 6th, 1938. This is the var. *pumila* (L.) Druce, 780/3e of the *British Plant List*, ed. 2. It formed quite a sward on bare ground in an exposed situation. For an account of this and other diseased states see Philipson in *Journ. Bot.*, *73*, 65 (1935).—P. M. Hall. " *Agrostis tenuis* Sibth., state infected with *Tilletia*."—W. R. Philipson.

Apera interrupta (L.) Beauv. (Ref. No. 3098.) 61, S.E. Yorks.; sand-pit, Flixton, July 5th, 1938. A chance remark to Dr W. A. Sledge reminded him that there were Yorkshire specimens of this species in Herb. Horrell in his possession and a visit to Flixton ensued. There is no reference to Yorkshire records in *Com. Fl.* in spite of the following entry in *B.E.C. 1916 Rep.*, 508 (1917):—" †2700. *Apera interrupta* Beauv. In a sand-pit of about half acre, Flixton, near Scarborough, A. J. Burnley, vide sp.; †Wakefield, York, Cryer, in *Nat.*, 251." Though the species is doubtless an alien at Wakefield (S.W. Yorkshire, v.-c. 63), Dr Sledge and I are very definitely of opinion that it is native at Flixton, where it is associated with such species as *Cerastium arvense* L., *Trifolium striatum* L., *Filago germanica* (L.) Huds., *F. minima* (L.) Pers. and a perennial " tricolor " pansy. This appears to be a considerable extension of the recorded range of this species as a native. The description, " near Scarborough," may be misleading; Flixton is south of the R. Derwent and therefore just in v.-c. 61.—P. M. Hall.

Gaudinia fragilis (L.) Beauv. 10, Wight; abundant in old pasture, Haven Street, June, 1938; an addition to the sheets I distributed in 1936.—J. W. Long.

Festuca elatior L. × *Lolium multiflorum* Lam. (Ref. No. 3854.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.— J. F. G. Chapple.

Festuca elatior L. × *Lolium perenne* L. (Ref. No. 3855.) 23. Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple.

Bromus commutatus Schrad. (Ref. No. 3857.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple.

Bromus lepidus Holmberg f. *lasiolepis* Holmberg. (Ref. No. 3856.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple.

Brachypodium distachyon (L.) Beauv. (Ref. No. 38183.) 39, Staffs.; on barley siftings, Burton-on-Trent, Aug. 31st, 1938.—J. F. G. Chapple.

Lolium perenne L. var. *cristatum* Pers. 7, N. Wilts.; Walcot, Swindon, June 13th and July 1st, 1938; spikes broad, flattened, coiled and drooping when young, afterwards ± erect but remaining broad, probably similar to the form distributed in 1924, see *B.E.C. 1924 Rep.*, 746 (1925).—J. D. Grose.

?*Lolium multiflorum* Lam. × *perenne* L. (Ref. No. 3858.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 28th, 1938.—J. F. G. Chapple.

Pholiurus filiformis (Roth) Schinz & Thell. ["*Lepturus filiformis* Trin."] 61, S.E. Yorks.; Hornsea sands, July 14th, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum.

Equisetum Telmateja L. ["*E. maximum* Lam."] 61, S.E. Yorks.; clay cliffs near Bridlington, July 22nd, 1938.—Coll. R. Bulley; comm. Nottingham Natural History Museum. "*E. Telmateja* is the correct name. *E. maximum* was a *nomen abortivum*."—A. H. G. Alston.

Athyrium Filix-foemina (L.) Roth. ["var. *convexum* Newm."] (Ref. No. 3535.) 8, S. Wilts.; Alderbury, Aug. 21st, 1938; fronds pale green when fresh; appears to be a form induced by exposure to the light.—J. D. Grose. "It hardly seems worth trying to assign varietal names to forms induced by environment conditions."—A. H. G. Alston.

Chara contraria Kuetz. var. *hispidula* Br. (det. G. O. Allen). (Ref. No. 3872.) 23, Oxon.; abundant in the canal at Wolvercote, July 1st, 1938.—J. F. G. Chapple.

11 MAR.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

VOL. XII. PART III.

REPORT FOR 1939-40

(WITH BALANCE-SHEETS FOR 1939, 1940, AND 1941).

BY

THE HONORARY EDITORS,

E. C. WALLACE,
1 Strathearn Rd., Sutton, Surrey.

A. J. WILMOTT,
Natural History Museum, Cromwell Road, London, S.W.7.

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[illegible]

NOTICES TO MEMBERS.

APPLICATIONS FOR MEMBERSHIP.

Applications for Membership should be sent to the Acting Secretary, Mr A. J. Wilmott, Natural History Museum, Cromwell Road, London, S.W.7.

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Subscriptions should be paid to the Treasurer, Mr J. E. Lousley, at 7 Penistone Road, Streatham Common, S.W.16. The Annual Subscription for Ordinary Members is Ten Shillings, payable on the 1st of January annually. Owing to the enforced restriction of the activities of the Society the Committee have decided that this should be reduced to Five Shillings per annum for the years 1941, 1942, and 1943. Some members have generously offered to continue payment at the old rate. Exchange Members need subscribe only at the same rate as Ordinary Members during the period when the distribution of plants is in abeyance.

MATERIAL FOR THE NEXT REPORT.

Material for the next Report—Records, Notes, etc.—should be sent to Mr A. J. Wilmott, as Mr E. C. Wallace has now joined H.M. Forces (R.A.F.).

SPECIMENS FOR IDENTIFICATION.

Ordinary Specimens for Identification may be sent to the Acting Secretary. Before sending critical material to the Society's Referees (see 1937 Report, 639-646), members should first ascertain from the Referee concerned whether he is in a position to determine specimens, as in existing circumstances any temporarily emended list is liable at any time to become inaccurate.

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1879, 1886, 1903, 1909.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. XII. PART III).

Victoria Regina.

Floreat flora.

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1942.

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THE
BOTANICAL SOCIETY & EXCHANGE CLUB OF THE BRITISH ISLES.

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*Elected March 1942.

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Brunker, J. P., 18 Grosvenor Place, Rathgar, Dublin.
Bull, Mrs H., Upper House, West Burton, Pulborough, Sussex.
Bunker, Herbert E. 27 Broad Oak Lane, Penwortham, Preston, Lancs.
†Burder, Lewis A. W., Denes, East Chiltington, Lewes.
†Burges, Dr R. C. L., 133 Soho Hill, Birmingham.
Butcher, R. W., B.Sc., Ph.D., F.L.S., Culford House, Ewe Lamb Lane, Bramcote, Notts

L Cadbury, Miss Dorothy A., 40 Edgbaston Park Road, Birmingham 15.
Cambridge, The Botany School, The University.
Cardew, Major J. W., 44 Putnoe Lane, Bedford.
Cator, Miss Diana, St Anne's, Happisburgh, near Norwich, Norfolk.
Chapman, Hon. Mrs D. B., c/o National Provincial Bank Ltd., Caernarvon, N. Wales.
*Chapple, Lieut. J. F. G., F.L.S., 41 A.A.Bde.H.Q., Horstead Hall, Coltishall, Norwich.
Charteris, Hon. G., Bishopstone, Bridge-Sollars, Herefordshire.
Chase, Capt. C. D., Campbell College, Portrush, Co. Antrim, N.I.
Chesher, W., M.A., 51 Queen's Drive, Mossley Hill, Liverpool 18.
Chilman, Rev. G. H., Dalton Parsonage, Thirsk, Yorks.
†Clark, Dr William A., Dept. of Botany, King's College, Newcastle-upon-Tyne 2.

Cobbe, Miss A. B., Lingworth, Sea Road, Felpham, Bognor Regis.
Cooke, R. B., Kilbryde, Corbridge, Northumberland.
Cornell, New York State College of Agriculture, Cornell Univ., Ithaca, N.Y., U.S.A.
*Corstorphine, Mrs Margaret, Hillside House, Arbroath, Angus.
Cory, Miss A. M., Fullerton Manor, Andover, Hants.
Creed, Dr R. S., M.A., New College, Oxford.
Crerar Library, John, 86 East Randolph Street, Chicago, Ill., U.S.A.
Crisp. Wm. C., Schoolhouse, Stewkley, Leighton Buzzard, Beds.
Cross, Edward R., 12 Filey Road, Scarborough.
Cross, Hon. Marjorie, Ash House, Broughton-in-Furness.
†Cruttwell, Rev. N. E. G., The Rectory, Basingstoke, Hants.

Daly, Mrs Bowes, Drumlanrig Castle, Thornhill, Dumfries-shire.
†Dandy, J. E., M.A., F.L.S., British Museum (Natural History), The Zoological Museum, Tring, Herts.
David, Miss Aileen M., Hillside, Llandaff, Cardiff.
Davy, Lady, Green End, Keyhaven, Lymington, Hants.
Day, Miss E., 32a St Peter Street, Sandwich, Kent.
†Day, Francis M., The Downs School, Colwall, Malvern.
Dent, G., Speedwell, Wych Cross, Forest Row, Sussex.
Dent, Mrs R. W., O.B.E., Flass, Maulds Meaburn, Penrith.
Devonshire, The Duke of, Chatsworth, Buxton, Derbyshire.
†Dony, John G., B.Sc., Ph.D., 41 Somerset Ave., Luton, Beds.
Ducie, Rt. Hon. The Earl of, c/o The Tortworth Estate Office, Falfield, Glos.
Dufferin, Brenda, Marchioness of, Sheldon Manor, Chippenham, Wilts.
Duncan, Miss Ursula, Parkhill, Arbroath, Angus.
*Dunston, Capt. Ambrose E. A., Burltons, Donhead St Mary, Wilts. (via Shaftesbury, Dorset).
Durham University, (Miss K. M. Chalklin, M.Sc.) Dept. of Botany, University Science Laboratories, South Road, Durham.

*†Edees, E. S., M.A., 19 Dartmouth Avenue, Westlands, Newcastle, Staffs.
Eire, National Museum, The Acting Director, Kildare Street, Dublin, Eire.
Eire, Controller, Stationery Office (Publications Branch), Dublin.
Eliot, Lady Alethea, Newtimber Place, Hassocks, Sussex.
†Ellis, A. E., M.A., F.L.S., Epsom College, Surrey.
Ellis, E. A., Castle Museum, Norwich.
Ellis, Edgar W., Gedham, Ossett, Yorks.
L Evans, Dr A. H., F.R.S.E., Cheviot House, Crowthorne, Berks.
†Evetts, Mrs E. F., J.P., Wood House, Tackley, Oxon.
Eyre, Mrs R. S. K., Woodside, Crowborough, Sussex.

Fanshawe, D. B., Fairydene, Wheeler Ave., Oxted, Surrey.
Findeisen, K. D., Yonder Fowdon, Churston Ferrers, South Devon.
*Fleming, Dr G. W. T. H., F.L.S., Barnwood House, Gloucester.
Foggitt, Mrs G., 22 Haslemere Road, Sketty, Swansea.
Frankland, J. N., 59 Otley Road, Skipton, Yorks.
†Fraser, G. T., B.A., 71 Fore Street, Kingskerswell, Newton Abbott, S. Devon.

L Geldart, Miss A. M., 2 Cotman Road, Norwich, Norfolk.
German, Mrs P., Newlands, The Plantation, Durrington, Worthing, Sussex.
Gilmour, J. S. L., M.A., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Glyn, Hon. Mrs Maurice, 28 Albert Hall Mansions, S.W.7.
Godalming Nat. History, Footpath and Rambling Society, (Hon. Sec.) E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.
†Goddard, H. J., The Knap, Skew Bridge, Wilton Road, Salisbury, Wilts.
Gomersal, Mrs M., High Kelling, Holt, Norfolk.
L Gordon, Seton, C.B.E., Upper Duntuilm, Isle of Skye.

Gough, Mrs H., Raford, Athenry, Co. Galway, Eire.
†Gough, J. W., M.A., 43 Sandfield Road, Headington, Oxford.
Graham, Mrs E., 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Rex, 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Prof. R. J. D., M.A., D.Sc., F.R.S.E., Dept. of Botany, The University, St Andrews.
Graveson, A. W., M.A., Tintagel, Stoke Road, Beaminster, Dorset.
Gray, Henry, Yewtree, West Malling, Kent.
Gray Herbarium, The, Harvard University, Cambridge, Mass., U.S.A.
Green, T. H., Sabinal, Weston, Bath.
Gregor, Rev. A. G., M.A., B.D., Firle Vicarage, near Lewes, Sussex.
*†Grose, J. D., 18 Regent Street, Swindon, Wilts.

Haines, John W., Midhurst, Green Lane, Hucclecote, Gloucester.
Haines, Mrs J. W., Midhurst, Green Lane, Hucclecote, Gloucester.
†Hall, Fredk. T., 2 Hartington Terrace, West Road, Buxton, Derbyshire.
Hall, Miss Margaret, The Gables, Weobley, Hereford.
†Hardaker, W. H., 451 City Road, Edgbaston, Birmingham 17.
Hardinge, Hon. Lady, St James's Palace, London, S.W.1.
†Hare, Dr C. Leighton, The Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey.
†Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., King's College, Newcastle-upon-Tyne.
Hartley, J. W., Irene, Marple Road, Stockport.
†Harvey, Rev. H. H., Clawton Vicarage, Holsworthy, Devon.
†Hassall, Mrs B., The Manor House, Wheatley, Oxford.
Haughton, Dr J. W., Tawnachie, Wood Lane, Falmouth.
Haynes, Gerald, 8 Canterbury Road, Oxford.
*Hayward, Miss Ida M., F.L.S., 7 Abbotsford Road, Galashiels, Selkirkshire.
Heron, Miss May, Erclands, Ercall Lane, Wellington, Salop.
Hichens, Mrs, c/o Mrs Hingston, Windward House, Tavistock, Devon.
Hill, S. Ashton, Carnaby, 19 Jordan Road, Four Oaks, Warwickshire.
Horticultural Society, The Royal, Vincent Square, Westminster, S.W.1.
*Howarth, W. O., D.Sc., F.L.S., Botany Dept., The University, Manchester 13.
Hull, University College, The Librarian, Hull.
Hurst, Miss Barbara, Rusper Nunnery, Horsham, Sussex.
Hurst, C. P., F.L.S., Landulph Rectory, Saltash, Cornwall.
Hutchinson, R. R., 11 Fryston Avenue, Croydon, Surrey.

Jack, James, F.L.S., Luggiebank, Cumbernauld Station, Glasgow.
Jackson, A. Bruce, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
Jekyll, Francis, Munstead Wood, Heath Lane, Godalming, Surrey.
Jowett, Miss Edith B., Oreton Mount, Grange-over-Sands, Lancs.

Kennedy, Mrs C. Moore, c/o Westminster Bank Ltd., Bromley, Kent.
Kew, H. Wallis, Penmoil, Cock Lane, High Wycombe, Bucks.
Kirby, Mrs G. E., Sankey House, Brook, near Ashford, Kent.
Knight, H. H., M.A., The Lodge, All Saints Villas Road, Cheltenham.

*Lang, Mrs D. K., Wyse Hill, Finchampstead, Berks.
*Last, G. V. C., F.L.S., M.R.C.S., L.R.C.P., 22 Rutland Ave., Sefton Park, Liverpool.
Lawn, J. G., C.B.E., Hon. D.Sc., Little Parrs, West Clandon, Surrey.
Leadbitter, E. C. E., C.V.O., 160 Addiscombe Road, Croydon.
Leake, Miss P., 17 Westmorland Road, Bromley, Kent.
Leather, Miss Vivien M., Wyards, Studland, near Swanage, Dorset.
Lee, John R., 96 Finlay Drive, Dennistoun, Glasgow, E.1.
†Legard, Lady Edith, Maes Court, Tenbury, Worcester.
Leicester Museum and Art Gallery, Leicester.
Lewis, J. Spedan, Leckford Abbas, Stockbridge, Hants.

Linnean Society of London, The, Burlington House, Piccadilly, W.1.
Little, Miss K. D., 19 The Avenue, Hitchin, Herts.
London Natural History Society (Botanical Section), G. R. A. Short (Secretary), 36 Parkside Drive, Edgware, Middlesex.
†Long, Jas. W., Hillside, St John's Road, Newport, Isle of Wight.
L Longfield, Miss C. E., 20 Pont Street, London, S.W.1.
†Lousley, J. E., 7 Penistone Road, Streatham Common, S.W.16.
Lucas, Baroness, 22 Sussex Square, Hyde Park, W.2.

†McClintock, Capt. D., Park Grove, Withyham, Tunbridge Wells, Sussex.
McGill, J. F., Ardantrae, 5a Racecourse Road, Ayr.
McInnes, Latimer, Briarlea, Campbeltown, Argyll.
†Mackechnie, Robert, B.Sc., 9 Skirving Street, Shawlands, Glasgow, S.1.
Mackenzie, Major Roderick, Fawley Court, Henley-on-Thames.
McLean, Prof. R. C., University College, Newport Road, Cardiff.
MacLeay, Kenneth N. G., Botany Dept., St Andrews University.
Makins, F. K., F.L.S., Great Down Cottage, Bruton, Somerset.
Manchester Museum, The, The University, Manchester 13.
†Marks, C. E., Islington Cemetery, East Finchley, N.2.
Marsden-Jones, E., F.L.S., Close Cottage, Littleton Panell, Devizes, Wilts.
Marsh, Miss F. H. B., J.P., F.L.S., Thornleigh, Mordiford, Hereford.
†Martin, Rev. W. Keble, M.A., F.L.S., The Vicarage, Torrington, Devon.
Matthews, Prof. J. R., Botany Department, The University, Old Aberdeen.
†Melville, R., B.Sc., Ph.D., F.L.S., Royal Botanic Gardens, Kew, Surrey.
†Mills, J. N., 131 Woodstock Road, Oxford.
Mills, Dr W. H., 23 Storey's Way, Cambridge.
Milne, James Fairweather, M.A., M.B., Ch.B., Rocksley House, Boddam, Peterhead, Aberdeenshire.
Milne-Redhead, E., B.A., c/o Mrs Edgar Milne-Redhead, Green Leaze, Cirencester, Glos.
Milvain, Mrs M., Green Close, Snowshill, near Broadway, Worcs.
Montgomery, Mrs R., 46 Frenchgate, Richmond, Yorks.
Morley, Earl of, Saltram, Plympton, Plymouth, Devon.

†Nelmes, E., Daglingworth Rectory, Cirencester, Glos.
Nelson, George A., Ph.C., F.L.S., 37 The Crescent, Adel, Leeds 6.
New York Botanical Garden (W. J. Robbins, Director), Bronx Park, New York, N.Y., U.S.A.
Northamptonshire Natural History Society, c/o H. G. Allen, B.Sc. (Hon. Sec., Bot. Sec.), Ivydale, Wootton, Northampton.
Norton, F., "Westward Ho," 3 Pencisely Rise, Cardiff.
*Nottingham Public Natural History Museum, Wollaton Hall, Nottingham.

Oxford University, Dept. of Botany. The Librarian, Oxford.
Oxford University, Dept. of Forestry, The Librarian, Oxford.

Palmer, The Hon. W. J. L., The Old House, Wonston, Sutton Scotney, Hants.
Parkin, J., M.A., F.L.S., Blaithwaite, Wigton, Cumberland.
Patton, Dr Donald, M.A., B.Sc., Ph.D., F.R.S.E., 15 Jordanhill Drive, Glasgow, W.3.
Penson, J. H., 11 Well Walk, Hampstead, N.W.3.
Phelps, Mrs J. V., Woodbury, East Avenue, Bournemouth, Hants.
Phillips, Edwin Masson, 26 Cheltenham Place, Plymouth, Devon.
Pickard, Miss Kathleen, Harveys, Glynde, Lewes, Sussex.
Pownall, Rev. G. C., Glenroy, Windmill Road, Minchinhampton, Glos.
†Price, W. R., Cockleford Mill, Cowley, near Cheltenham.
Priestley, Prof. J. H., B.Sc., D.S.O., Dept. of Botany, The University, Leeds.
Prime, C. T., M.A., F.L.S., 24 Hurst View Road, Croydon, Surrey.
†Pugsley, H. W., B.A., Andor, Allen's Green, Sawbridgeworth, Herts.

Ramsbottom, J., O.B.E., M.A., Dr.Sc., P.P.L.S., Keeper, Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
Rawlins, Miss E., Dysertmore, New Ross, Co. Wexford.
Rea, Carleton, B.C.L., M.A., 6 Barbourne Terrace, Worcester.
Rees, Mrs F. L., 5 Hill Park, Tenby, Pembrokeshire.
†Rees, John, B.A., M.Sc. (Adviser in Agricultural Botany), University College (S.W. & M.), Cathays Park, Cardiff.
L Richards, Mrs H. M., Caerynwch, Dolgelley, N. Wales.
Ridley, H. N., C.M.G., F.R.S., 7 Cumberland Road, Kew Gardens, Surrey.
Ridley, Hon. Mrs J., Mockbeggars Hall, Claydon, Suffolk.
*Rilstone, F., A.L.S., Lambourne Hill, Penhallow, Truro, Cornwall.
*†Rob, Miss C. M., Catton Hall, Thirsk, Yorks.
†Roche, The Lady, Chadlington, Oxford.
*Rose, Mrs Eric, Leweston Manor, Sherborne, Dorset.
Russell, Lady Victoria, The Ridgeway, Shere, Guildford, Surrey.

Salisbury, Prof. E. J., C.B.E., D.Sc., F.R.S., F.L.S., Willow Pool, 4 Gills Hill Lane, Radlett, Herts.
Salmon, Miss Hilda M., Harwood, Horsham, Sussex.
†Sandwith, Mrs Cecil, 26 Canynge Square, Clifton, Bristol, 8.
†Sandwith, N. Y., M.A., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
Saunders, Miss E. F., Ortler, Bouncers Lane, Prestbury, Cheltenham, Glos.
Severn, Lady, Winterbrook Lodge, Wallingford, Berks.
Seward, Mrs O. G., Weston House, near Petersfield, Hants.
Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex.
†Simpson, N. Douglas, M.A., F.L.S., F.R.M.S., Maesbury, 3 Cavendish Road, Bournemouth, Hants.
Skene, Prof. Macgregor, D.Sc., University, Bristol, 8.
*†Sledge, Dr W. A., 9 St Chad's Drive, Headingley, Leeds, 6.
Small, Prof. J., D.Sc., Dept. of Botany, Queen's University, Belfast, N.I.
†Smith, Dr H. B. Willoughby, M.B., F.R.C.S., St Clements, 9 Carson Road, Gainsborough, Lincs.
Smith, R. L., 24 Grand Avenue, Ely, Cardiff, Glam.
Smith, Prof. Sir Wm. Wright, D.Sc., Royal Botanic Garden, Edinburgh, 4.
L Southall, A. W., Clifford's Mesne, Newent, Glos.
South London Botanical Institute, 323 Norwood Road, London, S.E.24.
Sowter, F. A., Ashstead, 9 North Avenue, Leicester.
Stationery Office, H.M., Princes Street, Westminster, S.W.1.
†Stephenson, Rev. Dr T., D.D., Irfon, Aberystwyth.
Stern, Colonel F. C., O.B.E., M.C., Highdown, Goring-by-Sea, Sussex.
Stevenson, Miss E. H., 28 Foxcombe Road, Weston, Bath, Somerset.
Stewart, Mrs M. E., Partney, Spilsby, Lincs.
Stewart-Sandeman, Mrs, Achnashellach, Ross-shire.
†Still, A. L., B.A., Long Hayne, Cove, Tiverton, Devon.
Stuart, Mrs C. U., 120 London Road, Worcester.
Stuart-Edwards, J. J., Imperial Hotel, Exmouth, S. Devon.
Swaine, Miss A. K., Pisang Cottage, Nailsea, Somerset.
Swann, Eric L., 282 Wootton Road, King's Lynn.

Tahourdin, C. B., M.A., 86 Manor Road, Wallington, Surrey.
L†Taylor, Dr G., British Museum (Natural History), Cromwell Road, London, S.W.7.
Taylor, Miss M., 6 Kent Gardens, Ealing, W.13.
†Taylor, S. A., 34 Nelson Street, Leicester.
†Temperley, Geo. W., Restharrow, Apperley Road, Stocksfield, Northumberland.
†Templeman, A., Geological Museum, Exhibition Road, South Kensington, S.W.7.
Thomas, Charles, Arden, 48 Manor Road North, Edgbaston, Birmingham 16.

Thomas, Miss E. Mary, Moorfield, Nottage, Porthcawl, Glam.
Thorold, C. A., Hele, Bradninch, Devon.
Tindall, Mrs K. B., West Downs, Winchester, Hants.
Todd, Miss E. S., Aldbourne, Marlborough, Wilts.
Toke, Chas. Hugh, The Haven, Green Lane, Crowborough, Sussex.
Travis, W. G., 9 Barton Road, Liverpool 9.
Trethewy, A. W., Artillery Mansions, Victoria Street, S.W.1.
Tristram, Mrs R. M., F.L.S., Revillo, Ash Bank, Stoke-on-Trent, Staffs.
Tunbridge Wells Municipal Museum, 6 Upper Grosvenor Road, Tunbridge Wells, Kent.
Turnbull, Miss E., Stone Lodge, Vines Lane, Hildenborough, Kent.
Turner, A., 140 Pine Street, Nelson, Lancs.
Turrill, W. B., D.Sc., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

Ullman, Lt. Col. R. B., Trove, New Road, Esher, Surrey.

†Vachell, Miss Eleanor, F.L.S., Fairfield, Ely Road, Llandaff, Cardiff.
†Valentine, D. H., M.A., Ph.D., Botany School, Cambridge.
Victoria, The Public Library of, Melbourne, c/o Henry Sotheran Ltd., 2 Sackville Street, Piccadilly, W.1.
†Vivian, Miss C., F.L.S., 37 Wilton Crescent, London, S.W.1.

†Wade, A. E., F.L.S., Dept. of Botany, National Museum of Wales, Cardiff.
Waldy, Hon. Mrs H. P., Sonamerg, Higher Sea Lane, Charmouth, Dorset.
* †Wales, National Museum of, Dept. of Botany (Keeper, H. A. Hyde, M.A.), Cardiff.
* †Wallace, E. C., 2 Strathearn Road, Sutton, Surrey.
†Wallis, J. R., Timberlog, Parsonage Lane, Lamberhurst, Kent.
Warner, S. Allen, M.P.S., Whitelea, Broadway, Didcot, Berks.
L Warren, W. E., Selborne, Horsell Rise, Horsell, Woking, Surrey.
Washington, U.S. Dept. of Agriculture, The Librarian, Washington, D.C., U.S.A.
Watchorn, Dr Elsie, 25 Luard Road, Cambridge.
Watson, Wm., 245 Southlands Road, Bickley, Bromley, Kent.
Watts, Lt. Col. G. A. R., Highbury, Victoria Road, Fleet, Hants.
†Webster, Subaltern M. McCallum, A.T.S., c/o Bank of Scotland, Macduff.
L Wedgwood, Mrs, 2 Hatherley Road, Kew Gardens, Surrey.
Wedgwood Herbarium, The, Marlborough College, Wilts.
†Welch, Mrs B., B.Sc., 49 Lichfield Court, Richmond, Surrey.
Wells, Mrs E. M., 91 Colum Road, Cardiff.
Weyer, Major B. G. Van de, South Marston Manor, Swindon, Wilts.
Weyer, Major William Van de, Clyffe, Dorchester, Dorset.
Whellan, J. A., 2nd Lieut., R.A.O.C., 42 Stamford Street, Liverpool 7.
Whyte, James E., 31 Hayswell Road, Arbroath, Angus.
†Wilkinson, J. S., 26 Golder's Rise, Hendon, N.W.14.
Willan, Mrs Hugh, Bridges, Teffont, Salisbury.
Williams, Mrs F. R., 234 Highland Avenue, Winchester, Mass., U.S.A.
Williams, I. A., West Hall, Kew Gardens, Surrey.
Williams, M. L., Layton Villa, Linden Road, Bognor, Sussex.
†Wilmott, A. J., M.A., F.L.S., Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
†Wilson, Albert, F.L.S., Tir-y-Coed, Ro Wen, near Conway.
Winter, W. P., B.Sc., F.G.S., 6 Grange Avenue, Saltaire, Yorks.
†Wolley-Dod, Lt. Col. A. H., Berkeley Cottage, Mayfield, Sussex.
Woodhead, J. E., B.Sc., F.I.C., Ph.C., 325 Kennington Road, London, S.E.11.
L Wright, Dr F. R. Elliston, Braunton, N. Devon.

Yeoman, Miss Ruth, The Green, Brompton, Northallerton, Yorks.
York Public Library, City of, York.

Young, Rev. Andrew, Stonegate, Tunbridge Wells, Kent.
L Young, Miss Gertrude A., 5 Woodlands Terrace, Glasgow, C.3.
Yuill, Edward, Norwood, Towthorpe Lane, Haxby, York.

ORDINARY MEMBERS ABROAD.

(The following are still regarded as members although the difficulty or impossibility of communicating with them under present conditions has prevented confirmation. Those members living overseas who have been able to return the Reconstruction Form are included in alphabetical order in the main list.)

Arsene, Bro. Louis, Maison St Joseph, Highlands, Jersey.
Bergen Museum, Botaniska Avdeling, Bergen, Norway.
Brooklyn Botanic Gardens, Brooklyn, N.Y., U.S.A.
Genève, Switzerland, Le Directeur du Conservatoire et du Jardin botanique de la Ville de.
Holland, J. S. (Westwell Manor, Burford, Oxon.), New Modderfontein Staff Mess, P.O. Van Ryn Benein, S. Africa.
Lindquist, Dr B., Skogshogskolan Experimentalfaltet, Stockholm, Sweden.
McCrea, Mrs M. A., 4 Springfield Terrace, King's Road, Guernsey.
Nannfeldt, Dr John Axel, Botaniska Institutionen, Uppsala, Sweden.
Oslo, The Botanical Museum of the University of, Norway.
Pharmacie Bibliotheque de la Faculté de, 4 Avenue de la Observatoire, Paris, France.

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Non-Subscribing Members.		
Honorary Members	23	
Corresponding Members ..	6	
		29
Subscribing Members.		
Ordinary Members	280	
Life Ordinary Members ...	13	
Exchange Members	20	
		313
Total Membership		342

ACCOUNTS FOR THE YEAR 1939.

GENERAL FUND.

To Balance from 1938 ...	£184 2 0	By Insurance		£0 6 0
,, Subscriptions Received in 1939 (including £20 paid in advance)	180 7 3	,, Printing (other than Report) and Stationery and Binding		23 11 7
,, Excursion Fees	0 10 0	,, Printing Report		105 7 6
,, Sales of Reports and Reprints	3 14 7	,, Expenses of Distributor (1938)		1 9 10
		,, Cheque Book		0 4 2
		,, Honorarium to Hon. Secretary		25 0 0
		,, Postages and Petty Expenses :—		
		Hon. Sec., ...	£9 12 4	
		Act. Hon. Sec.	1 8 9	
				11 1 1
		,, Balance		201 13 8
	£368 13 10			£368 13 10

PUBLICATIONS FUND.

To Balance from 1938 ...	£137 7 4	By Balance	£152 3 0
,, Sales of Comital Flora, Plant List, etc.	14 15 8		
	£152 3 0		£152 3 0

LIFE MEMBERS' FUND.

To Balance from 1938 ...	£144 8 0	By Balance	£144 8 0
	£144 8 0		£144 8 0

MISS TROWER'S FUND.

To Balance from 1938 ...	£16 7 11	By Balance	£16 7 11
	£16 7 11		£16 7 11

BENEVOLENT FUND.

To Balance from 1938 ...	£41 3 6	By Balance	£41 3 6
	£41 3 6		£41 3 6

BALANCE SHEET AT 31ST DECEMBER 1939.

General Fund	£201 13 8	500 National Savings Certificates, at cost	£400 0 0
Publications Fund	152 3 0	Cash at Bank	134 16 1
Life Members' Fund	144 8 0	Post Office Savings Bank Deposit (Life Members' Fund)	21 0 0
Miss Trower's Fund	16 7 11		
Benevolent Fund	41 3 6		
	£555 16 1		£555 16 1

(Signed) FRANCIS DRUCE,
Hon. Treasurer.

Examined and found correct.
February 5th, 1940.

(Signed) H. W. PUGSLEY,
Hon. Auditor.

ACCOUNTS FOR THE YEAR 1940.

GENERAL FUND.

To Balance from 1939 ...	£201 13 8	By Insurance	£0 6 0
,, Subscriptions Received in 1940 (including £18 12s 6d paid in advance)	198 1 7	,, Printing and Stationery	1 14 0
,, Sales of Reports and Reprints	2 17 10	,, Advertisement (Wild Flower Magazine)	0 10 0
		,, Honorarium to Hon. Secretary (half-year)	12 10 0
		,, Postages and Petty Expenses (Hon. Sec.) ...	5 9 7
		,, Balance	382 3 6
	£402 13 1		£402 13 1

PUBLICATIONS FUND.

To Balance from 1939 ...	£152 3 0	By Balance	£154 19 9
,, Sales of Comital Flora and Plant List	2 16 9		
	£154 19 9		£154 19 9

LIFE MEMBERS' FUND.

To Balance from 1939	£144 8 0	By Balance	£144 8 0
	£144 8 0		£144 8 0

MISS TROWER'S FUND.

To Balance from 1939 ...	£16 7 11	By Balance	£16 7 11
	£16 7 11		£16 7 11

BENEVOLENT FUND.

To Balance from 1939 ...	£41 3 6	By Balance	£41 3 6
	£41 3 6		£41 3 6

BALANCE SHEET AT 31ST DECEMBER 1940.

General Fund	£382 3 6	500 National Savings Certificates, at cost	£400 0 0
Publications Fund	154 19 9	Cash in hand	0 0 9
Life Members' Fund	144 8 0	Cash at Bank	318 1 11
Miss Trower's Fund	16 7 11	Post Office Savings Bank Deposit (Life Members' Fund)	21 0 0
Benevolent Fund	41 3 6		
	£739 2 8		£739 2 8

(Signed) FRANCIS DRUCE,
Hon. Treasurer.

Examined and found correct.
February 17th, 1941.

(Signed) E. C. E. LEADBITTER.

ACCOUNTS FOR THE YEAR 1941.

GENERAL FUND.

To Balance from 1940 ...		£382 3 6	By Printing and Postage of Interim Report		£7 11 8
,, Subscriptions Received in 1941 :—			,, Printing (other than Report) and Stationery ...		8 2 3
Paid to late Treasurer ..	£86 3 6		,, Ledgers, Stationery, etc., for Reconstruction of Accounts		4 13 3
Paid to J. E. Lousley ...	32 9 3	118 12 9	,, Postages and Petty Expenses :—		
,, Donation Received ...		1 9 10	Treasurer ...	£2 11 11	
,, Sale of Reprint		0 1 6	Acting Secretary ...	1 10 0	
			Joint Editor	0 12 6	
			Distributor, 1939	1 9 10	6 4 3
			,, Cheque Book		0 8 4
			,, Fire Insurance on Books at Yardley Lodge		0 6 0
			,, Balance		475 1 10
		£502 7 7			£502 7 7

SUSPENSE FUND.

To Difference between Assets on October 22nd, 1941, and those shown on Balance Sheet of December 31st, 1940	£113 17 4	By Subscriptions paid between January 1st and October 22nd, 1941, since claimed and transferred to Subscriptions Received Account	£86 3 6
,, Disbursements made by the late Treasurer allocated to the appropriate accounts	2 17 2	,, Balance	30 11 0
	£116 14 6		£116 14 6

PUBLICATIONS FUND.

To Balance from 1940 ...	£154 19 9	By Balance	£155 19 9
,, Donation (Prof. Matthews)	0 5 0		
,, Sale of Comital Flora ...	0 15 0		
	£155 19 9		£155 19 9

LIFE MEMBERS' FUND.

To Balance from 1940 ...	£144 8 0	By Balance	£145 16 0
,, Interest on Post Office Savings Bank Deposit, 1939-1940	1 8 0		
	£145 16 0		£145 16 0

MISS TROWER'S FUND.

To Balance from 1940 ...	£16 7 11	By Balance	£16 7 11
	£16 7 11		£16 7 11

BENEVOLENT FUND.

To Balance from 1940 ...	£41 3 6	By Balance	£41 3 6
	£41 3 6		£41 3 6

BALANCE SHEET AT 31ST DECEMBER 1941.

General Fund	£475 1 10	500 National Savings Certificates, at cost	£400 0 0
Publications Fund	155 19 9	Cash at Bank	242 12 0
Life Members' Fund	145 16 0	Deposit at Post Office Savings Bank	222 8 0
Miss Trower's Fund	16 7 11		
Benevolent Fund	41 3 6		
Suspense Fund	30 11 0		
	£865 0 0		£865 0 0

(Signed) J. E. LOUSLEY,
Hon. Acting Treasurer.

Examined and found correct.
February 14th, 1942.

(Signed) H. W. PUGSLEY,
Hon. Auditor.

SUMMARY OF PROCEEDINGS OF MEETINGS (NOVEMBER 1939—MARCH 1942).

A meeting of the Committee was held on November 2nd, 1939. It was agreed that the Treasurer, Mr Francis Druce, who had taken over the secretarial work when Mr Chapple was mobilised for active service, should continue as Acting Secretary during Mr Chapple's absence, and that plants normally sent to the Hon. Secretary for identification should be sent either to the Keeper of Botany, British Museum (Nat. Hist.), Cromwell Road, S.W.7, or to the Director, Royal Botanic Gardens, Kew, Surrey, who had kindly offered to deal with them so far as possible having regard to the exigencies of the position at the time. It was decided to cancel the Conversazione arranged for November 15th. It was arranged that Mr Druce should notify members of those arrangements made which affected them.

A meeting of the Committee was held on March 13th, 1940, at which it was decided that in view of the state of war the present Officers and Members of Committee should continue during the war and that the Committee should have power to co-opt to any vacancies on the Committee. It was decided that Excursions, Conversazione, and Plant Distributions should be suspended for the duration of the war. It was decided that, should circumstances permit, an endeavour should be made to hold an autumn meeting on October 15th in place of the Conversazione at the rooms of the Linnean Society, where tea could be provided, at which a talk should be given by Mr Wilmott on some subject of interest to members [; but after the beginning of the air attack on London the arrangements for this were dropped]. The Editor reported that pressure of war work had left him little time to deal with the Reports for 1938 (part 2) and 1939; it was decided that the Reports in preparation should be completed as and how he should be able to find time to do so, but that no Report for 1940 could be contemplated.

At the Annual General Meeting which followed, presided over by the Chairman, the Rt. Hon. H. T. Baker, the recommendations and decisions of the Committee were approved, and the Reports of the Acting Secretary and Treasurer were adopted. The Officers were re-elected, and Mr Francis Druce was elected Acting Secretary.

Owing to the conditions prevailing in London, no meeting of the Committee took place in the autumn of 1940.

A meeting of the Committee was held on March 26th, 1941, at which it was decided that owing to the non-publication of the Reports the Annual Subscription should be reduced for the time being to 5s per annum, should the following Annual General Meeting agree, and that amounts already received or later sent in excess of that amount should be carried forward towards future subscriptions. The Chairman reported that in June 1940 he had received a letter from the Hon. Editor stating that the organisation of the local Defence Volunteers in Fareham—a task urged upon him which he felt unable to refuse—left him with absolutely no leisure to devote to the Society's affairs, and that as he saw no likelihood of being able to deal with the outstanding Reports in the near future, he asked to resign. After appreciation of the valuable services given by the Hon. Editor had been expressed, it was decided that he should be asked to continue, the Reports being left until he should again be able to attend to them. As the medium of the Reports was not available, it was decided to communicate with members by means of a circular letter [; but this fell through owing to the tragic death of the Acting Secretary shortly after the meeting]. In presenting his financial statement, the Treasurer explained that as Mr Pugsley had not been available to audit the accounts, he had arranged for this to be done by Mr Leadbitter, and it was left to the Treasurer to arrange for the audit next year.

As it had been found necessary in existing circumstances to make some departure from the Rules of the Society it was decided that while the Rules should be adhered to so far as possible, no General Meeting should be required for action so taken necessitated by the state of emergency, and that the Chairman and Vice-Chairman together should have power to act on behalf of the Society in any emergency that should arise.

At the Annual General Meeting held the same afternoon the Reports of the Acting Secretary and Treasurer were adopted and the Officers and Committee were re-elected.

A meeting of the Committee, called by the Chairman and Vice-Chairman, was held on October 22nd, 1941, to consider and make arrangements to meet the situation that had arisen through the deaths of the Hon. Treasurer and Hon. Editor in April and August respectively. It was decided that Mr A. J. Wilmott, who owing to the death of the Acting Secretary had made the arrangements for the meeting, should continue as Acting Secretary, that Mr J. E. Lousley should be Acting Treasurer, and that Messrs E. C. Wallace and A. J. Wilmott should be Acting Joint Editors, Mr Wallace having first been co-opted to the Committee. It was decided that the Reports for 1938 and 1939 should be completed as soon as possible, and that if it would save expense the two parts of the 1939 Report could be issued in a single cover. It was agreed that a Report for 1940 should be produced on the usual lines from the material available in Mr Hall's files* and that this should include all ascertainable alterations of addresses and also indication of which members of the Society's Panel of Referees were still available for the determination of specimens. It was agreed that in general all material available for Reports should be published. It was decided that a notice should be sent to all members informing them of the present state of the Society's affairs, and in particular of the reduction of the

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*As most of this material was found to belong to the Report for 1939, the Report for 1940, which by itself would have been very slender, has been combined with that for 1939.—Ed.

Annual Subscription and of the causes of the enforced changes of officers. Dr R. C. L. Burges and Miss E. Vachell were co-opted to the Committee.

A meeting of the Committee was held on March 25th, 1942, followed in the afternoon by the Annual General Meeting, presided over by the Chairman, the Rt. Hon. H. T. Baker, at which about 20 members attended. The reports of the Acting Secretary and Acting Treasurer, sent out with the notice calling the meeting, were adopted. Mr Wallace's report for the Acting Editors was also adopted. The subscription for 1943 was fixed at the reduced rate of 5s in view of the non-publication of any Reports in 1940 and 1941. The Hon. Acting Treasurer explained his reconstruction of the accounts, and it was agreed that the Society owed him—and the auditor, Mr Pugsley—a great debt of gratitude for the laborious work which had been so successfully accomplished. It was agreed that in future lists of members the names of Life Members should be specially indicated. The following officials were elected: —Hon. Acting Secretary—Mr A. J. Wilmott; Hon. Treasurer—Mr J. E. Lousley; Hon. Joint Editors—Messrs E. C. Wallace and A. J. Wilmott. Mr H. W. Pugsley was appointed Auditor. Messrs J. F. Pickard, W. R. Sherrin, and E. W. Swanton were elected Corresponding Members of the Society. An offer made by Mr E. G. Baker to bequeath to the Society a portrait in oils of his father, Mr J. G. Baker, was accepted; the portrait, by Wilson Foster, 41 by 36 inches in size, was hung in the Royal Academy exhibition, and was the subject of a famous cartoon in "Punch."

HONORARY ACTING SECRETARY'S REPORT.

Somewhat before the outbreak of war, the Hon. Secretary was mobilised for active service with a Territorial A.A. Battery. At the Chairman's suggestion Mr Francis Druce, our Treasurer, undertook the Secretarial work also. Following the Committee Meeting called to settle emergency matters, members were notified early in November 1939 of the arrangements which had been made. The conditions in London in the autumn of 1940 were such that no meeting of the Committee was held, but the Annual General Meeting, preceded by a meeting of the Committee, was held as usual in March 1941, except that the attendance was naturally much reduced.

In April 1941 misfortunes began to fall on the Society. By enemy action it lost its Treasurer and Acting Secretary, together with the Society's documents in his charge. In May the Editor became seriously ill. In addition to his arduous work as Chairman for Hampshire of the Live Stock Control of the Ministry of Food, he had in May 1940 responded to an appeal to organise personally the Fareham Platoon of the local Defence Volunteers. The effects of his overwork had begun to show in March 1941, when he was far from well. In August, when a return to health seemed likely, a sudden relapse proved fatal. The

Society owed much to the energy and capacity of these two, and their loss, together with the absence of the Hon. Secretary, left the Society without executive officers. Acting under their emergency powers, the Chairman and Vice-Chairman arranged that Mr A. J. Wilmott should undertake the secretarial work for the time being. A meeting of the Committee was called, at which the arrangements necessary for carrying on the work of the Society were made. An account of the recent events was issued to all members in November 1941, in the form of a Report on the State of the Society's Affairs. With this Report was included a form to be filled up by members in order to provide the Acting Treasurer with the data necessary for a reconstruction of the destroyed accounts and membership list.

The stock of the Society's publications at Yardley Lodge has been set in order through the kindness of Dr Polunin, in whose charge, on behalf of the University of Oxford, the herbarium of Dr Druce now is. Arrangements have been made for supplying from this stock the wants of members, who should apply to the Acting Secretary. Very few copies of the *Comital Flora* are now left.

Just as it appeared that the misfortunes of the Society had been largely overcome, another blow has fallen upon us through the death of Mr R. H. Corstorphine, who, as Managing Director of T. Buncle & Co. Ltd., for so long has dealt so admirably with our publications. His knowledge and sound judgment have been of invaluable service to the Society. I am glad to be able to state, however, that the firm which he so ably managed will continue their connection with the Society.

A. J. WILMOTT.

HONORARY TREASURER'S REPORT.

The financial affairs of this Society had been in the very capable hands of the late Francis Druce since March 17th, 1937, when he was elected Treasurer after acting in that capacity for about six months. Under his guidance the monetary position of the Society was greatly improved and the Committee had learned to place complete confidence in his sound judgment.

The calamity which deprived the Society of its Treasurer also destroyed the books of account, and when I took over the work of reconstruction on October 22nd, 1941, the only record of transactions carried out during the early part of the year came from a duplicate statement of the Banking Account which was kindly supplied by the Westminster Bank Ltd. It was therefore necessary to appeal to members for the details necessary to reconstruct the accounts; a procedure not without precedent in the history of the B.E.C. After the famous fire at Thirsk three-quarters of a century ago, the then Treasurer, R. D. Carter, sent out a circular dated May 23rd, 1864, appealing to members for information similar to that for which we had to ask on December 1st, 1941.

In the new books of the Society it was necessary to open a " Suspense Fund," to which was credited the difference between the assets shown on the Balance Sheet published on December 31st, 1940, and those traced at the date I took over. Entries to this account were passed as receipts and payments made during the early part of the year were traced. The balance of £30 11s 0d which remained on this account when the books were closed for the year is probably almost entirely composed of subscriptions paid to Mr Druce for which members have not submitted claims. To this extent the figure of £118 12s 9d shown as " Subscriptions Received during 1941 " shows a less serious decrease on the corresponding figure for 1940.

Owing to the considerable number of "Reconstruction Forms" which had not been returned by the end of the year it was not possible to show the amount of " Subscriptions paid in advance " as a separate figure in 1941 accounts, but this practice will be resumed in 1942.

In interpreting the Balance Sheet it must be remembered that the cost of the Distributor's Reports for 1938 and 1939, and the Editor's Reports for 1939, 1940, and 1941 has yet to be charged to the balance of the General Fund.

The subscription for 1941, 1942, and 1943 has been reduced to 5/- per annum for both Ordinary and Exchange Members. This is merely a temporary war-time measure intended by the Committee to allow for the enforced reduction in our publications. Any amounts overpaid will be carried forward to the subscribers' credit for the following year. Several members have generously expressed a wish to continue payment at the old rates. All subscription accounts have been made out in triplicate—copies being held also by Messrs Wallace and Wilmott. This arrangement will be continued while the present emergency exists.

Finally, I wish to express gratitude to those members who returned the " Reconstruction Forms " promptly, and thus facilitated the production of the new accounts and of the new membership list which is considered separately below. To our Hon. Auditor, Mr H. W. Pugsley, I should like to add my personal thanks to those of the Society for the trouble he took in auditing the accounts in a year with so many complications.

J. E. Lousley.

REPORT ON THE RECONSTRUCTION OF THE MEMBERSHIP LIST.

At the time of his death Mr Francis Druce was not only Treasurer of the Society, but also Acting Secretary owing to the absence of Mr John Chapple with H.M. Forces. It thus happened that the membership records were destroyed at the same time as the books of account. The new Treasurer undertook the reconstruction of both sets of records.

Fortunately, a list of members revised to 1939 had been published in the Report for 1938, and this list, subject to corrections known to the officers (assisted by Mrs Foggitt and Lady Davy) was used to send out on December 1st, 1941, a form which members were asked to complete. The response was very gratifying, and by January 15th, 1942, only 170 members had failed to reply. Further correspondence and enquiry, in which the Treasurer received great assistance from Mrs Foggitt and other members of the Committee, reduced the number outstanding to 44, and efforts are still being made to get in touch with these former members.

The printed list of members in 1939 was made up as follows:—

Honorary Members	24
Corresponding Members	3
Ordinary and Exchange Members ...	419
Total Membership	446

Of these members, 37 have resigned; we have been advised of the death of 30; two state that their names were included in error, and, as mentioned above, 44 have failed to reply. We have added 9 new members to our list, which therefore now totals 342.

Since the last Report we have been advised of the death of the following members:—Miss Lucy Burton, Mrs Barrow Cadbury, Lady Gwendoline Churchill, Mrs James Farrer, Mrs B. Gambier-Parry, Viscountess Gladstone, Mrs H. Graham, Mrs E. M. Macalister Hall, Mrs R. Newman, Lady Margaret Watney, Mrs C. L. Wilde, Miss W. Wilkinson, Monsieur P. Riencourt de Longpré, Rev. Preb. R. J. Burdon, Sir Jeremiah Colman, Col. H. H. Johnston, Rev. H. J. Riddelsdell, Principal A. H. Trow, and Messrs J. E. Arnett, T. Bates Blow, R. H. Corstorphine, Francis Druce, R. J. Flintoff, H. J. Gibbons, Patrick M. Hall, I. Helsby, R. W. Robbins, Lionel de Rothschild, W. A. P. Sprott, and G. Cresswell Turner. Many of the names in this list will be familiar as those of botanists who have in the past done much to further the aims of the Society—their loss is a very serious blow.

The following have resigned:—Miss Winifred Bigg, Miss Violet E. D. Birchall, Lady Colquhoun, Mrs Colville, Lady Edgar, Mrs H. Foster (née Baring), Miss C. S. Fry, Miss C. E. Godman, Miss E. Godman, Miss M. Grenfell, Lady Moyra Loyd, Miss Ann McQuire, Mrs H. Manfield, Lady Evelyn Mason, Miss Narcissa C. Massy, Mrs Oddy, Mrs R. Orme, Miss Mary M. Pinkett, Miss M. de Winton; Rev. W. H. Blythe Martin, Bournemouth Natural Science Society, Dr H. W. Daltry, Board of Greenkeeping Research, Lord Macmillan, Manchester Public Libraries, National Institute of Agricultural Botany (Cambridge), Oxford City Library, Prof. F. E. Weiss, and Messrs W. C. Barton, T. A. Dymes, H. Foster, L. Beeching Hall, F. W. Holder, James Jack (of Arbroath), Joshua Lamb, David Nutt (as Agent), and Hugh Phillips. Many of these resignations date from the early days of the war, and we hope that a large proportion of them will prove to be only temporary.

J. E. Lousley.

HONORARY JOINT EDITORS' REPORT.

The causes of the late appearance of the Society's Reports are indicated in the Summary of Proceedings of Meetings and Report of the Acting Secretary. When Mr Chapple was mobilised, some of the material required for the second part of the Report for 1938 was still outstanding, both from leaders of excursions and from some of the Referees in connection with the plant distribution. Mr Hall's attempts to obtain these were only partially successful. Some of this needed material had been sent to Yardley Lodge, but in Mr Chapple's absence it could not be found. The Reports of the Distributors for 1938 and 1939 were therefore completed by Mr Hall as far as he was able to do so, and corrected proofs of both were returned to the printers. Mr Hall subsequently became so fully engaged in war work, both day and night, that he had absolutely no free time to devote to these matters before he became ill, and these proofs remained with the printer until they were returned to the Acting Secretary in the autumn of 1941.

Our first duty in the capacity of Joint Editors was to prepare and send out the much needed Report on the State of the Society's Affairs, but at the same time requests were sent to all who had led excursions in 1938 and 1939 to send in accounts of those which they had conducted. We would now express our thanks to all those who after so great a lapse of time prepared these accounts so that our Reports could be brought up to date. As Mr Hall had already completed the Distributor's Report for 1938, except for enlarging his Editorial introduction to bring it up to date, we considered it best to leave that part unaltered, and merely add to the second part of the Report for 1938 the promised account of the excursions held in that year and an introductory paragraph.

The " Plant Records " and papers for the Report for 1939 had been filed ready for attention by Mr Hall, and only required editing. As no extra material, except for a few " Plant Records," had been received towards a Report for 1940, it seemed best to deal with these two years together, especially as there was no Distribution for 1940. " Plant Notes " have been compiled as in the past. Some Abstracts from Literature have been added, mostly supplied by Messrs H. A. Hyde and A. E. Wade, but circumstances have not permitted this section to be dealt with as fully as usual. The Summary of Proceedings of Meetings had perforce to be reconstructed from memoranda and memory, as the Society's documents had been destroyed, but an endeavour has been made to bridge the gap between the publication of the first part of the Report for 1938 and the present time. The leaders of the excursions held in 1939 all supplied accounts of them, with the exception of Mr Chapple, who is not in a position to do so, but several of those who took part in the Mull excursion have supplied information for the preparation of the account included here, and to them we offer special thanks. We hope that with the publication of the present Report all outstanding matters will have been dealt with. Every effort has been and will be made to maintain the standard of our Reports, but as regards future Reports, little material is at present available. Those who have any Plant Records or papers suitable for publication should send them to either of the Joint Editors.

The additions and corrections entered by Mr Hall in his copies of the *Comital Flora* and *Plant List*, ed. 2, in preparation for new editions of these works, the former nearly out of print, have been or are being entered into their own copies by the Joint Editors and the Treasurer, as a safety measure to avoid the loss of so great an amount of work should Mr Hall's copies be destroyed. The card-indexing of Plant Records begun by Mr Hall is being continued by Mr Wallace.

E. C. Wallace; A .J. Wilmott.

OBITUARY.

Harold Stuart Thompson, A.L.S. (1870-1940). Although H. Stuart Thompson was better known as an official of the Watson Botanical Exchange Club, he was a member of our Society for a time after the closing of the other Club in 1934. He was born at Bridgwater, a member of a Quaker family, and educated at Sidcot, Bootham, University College, Bristol, and Christ's College, Cambridge. Much of his time before the last war was spent on the Continent, when he produced books on Alpine plants, followed later (1914) by *Flowering Plants of the Riviera*. After the war he settled in Bristol and became well known and respected by a wide circle of Somerset and other botanists. He was most generous with his duplicate plants and, before he died, gave away most of his herbarium to the Universities of Birmingham and Reading. He was a frequent contributor to the *Journal of Botany*, and also to *The Field*, writing on many branches of natural history. Water-colour drawings and photography were other interests carried on during a full life.

E. C. Wallace.

PERSONALIA.

FLORA OF HERTFORDSHIRE (v.-c. 20).

The Hertfordshire records of the late J. E. Little are with Mr A. G. Harrold (5 Baron's Gate, East Barnet), who is working on the Flora of the county on behalf of the Hertfordshire Natural History Society.

FLORA OF BEDFORDSHIRE (v.-c. 30).

Our member, Mr J. G. Dony (41 Somerset Avenue, Luton) is working on the Flora in spite of the prevailing conditions. Through the kindness of Miss K. D. Little, the Bedfordshire records of her late father, Mr J. E. Little, have been transcribed by Mr Dony, who is assisted by several local botanists. Anyone able to do field work in the county is invited to communicate with Mr Dony. Helpers with other researches would be welcomed.

REPORT ON THE EXCURSIONS ARRANGED IN 1939.

Five excursions were arranged, four of which took place.

June 17-18. Oxfordshire and Northamptonshire, v.-cc. 23 and 32. Elm Hunt. Leader: Dr R. Melville.

Most botanical excursions have as their objective one or a few small pieces of territory which are examined in some detail. This plan could hardly be followed where a study of our native elm population was concerned as it was necessary to range over a large area. This elm hunt was essentially a mobile affair.

Eight, shall I say mechanised, botanists met at Oxford and proceeded via Oddington to Charlton on Otmoor, where some interesting and graceful hybrids of *Ulmus Plotii* Druce were examined as well as a number of Dutch elms, *U. hollandica* Mill. var. *major* Rehd., many of which were ravaged by elm disease. The route then lay by Bletchington and Bloxham to Banbury. On the way a densely pubescent form of *U. glabra* Huds. was examined with leaves as narrow as the var. *montana* Lindquist, and a number of individuals of the hybrid *U. glabra* × *Plotii* mostly with the habit of *U. glabra* and various combinations of the leaf characters of the two species. At West Barr Street, Banbury, the type tree of *U. Plotii* was studied as well as some young specimens and several hybrids. Then followed a short trip along the Warwick road to inspect some fine trees of Moss's *U. nitens* var. *Sowerbyi* and back into Banbury to stay the night.

The hunt continued in Northamptonshire on the Sunday, which was marred by showery weather, by way of Thorpe Mandeville and Abthorpe to Towcester, in country not previously explored for elms by any of the party. Forms of the hybrid *U. glabra* × *Plotii* were frequent and in the Abthorpe area hybrids of *U. Plotii* with another species, probably *U. carpinifolia* Gleditsch., were observed. The Plot elm itself was notably absent from this region, which consists largely of low rolling hills, and was not seen again until the afternoon, when a number of trees of all sizes were found along the river at Towcester. Tea was obtained in Towcester and the party then broke up. It was generally agreed that further excursions to survey the distribution of critical species and genera in the flora would add much to our knowledge.

R. M.

June 30-July 3. Pembrokeshire, v.-c. 45. Leader: Mr A. E. Wade, F.L.S.

Seventeen members and friends attended, most of whom stayed at headquarters, the Castle Hotel, Haverfordwest. In spite of the very poor weather experienced in June and July, we were fortunate in having a fine week-end. Each morning the party set out at about ten o'clock, provided with sandwich lunch; tea being taken on Saturday and Sunday at Goodwick and Tenby respectively.

Saturday, July 1st. A visit was paid to the marshes and pools at Mathry and the fields and cliffs at Strumble Head; the outward journey was made via Treffgarne Rocks and the homeward journey via the picturesque Gwaun Valley. The Treffgarne Rocks and an extensive marsh in the Gwaun Valley were examined. The latter place would well repay further exploration.

Sunday, July 2nd. The salt marshes by the Eastern Cleddau and the Daucleddau were examined at Minwear, Lawrenny, Garron Pill and Carew. Canastan and Minwear woods were visited and short stops were made at several places to examine small marshes.

Monday, July 3rd, was spent on the coast near Marloes; a short stop was also made at Broadhaven on the outward journey. As most of the members wished to return home on this day the party returned to Haverfordwest for tea.

An effort was made during this week-end to avoid as far as possible the more or less well-worked parts of Pembrokeshire and to concentrate upon botanically unworked areas.

PLANTS OBSERVED IN PEMBROKESHIRE.

Ranunculus Baudotii Godr. Pool, near Mathry.
Aquilegia vulgaris L. Near Holloway Farm, near Tenby.
Fumaria Boraei Jord. Near Strumble Head and near Marloes.
Nasturtium officinale R. Br. var. *microphyllum* Boenn. Martin's Haven.
Brassica nigra L. Broadhaven.
Diplotaxis tenuifolia (L.) DC. Haverfordwest.
Lepidium Smithii Hook. Near Marloes and near Strumble Head.
Viola canina L. emend. Rchb. Strumble Head.
Polygala dubia Bellynck. Broadhaven.
Silene maritima With. A compact form with small leaves, 5-12 × 2-4 mm. Cliff edges, Martin's Haven.
S. anglica L. Cultivated fields and roadsides near Marloes and near Strumble Head.
Lychnis alba Mill. × *dioica* L. Near Strumble Head.
Cerastium tetrandrum Curt. Martin's Haven.
Stellaria Dilleniana Moench em. Druce var. *palustris* (Retz.) Druce. Near Mathry.
Sagina subulata (Sw.) Presl. Abundant at Martin's Haven and Strumble Head.
S. maritima Don. Salt marsh by Minwear Wood.
Spergularia rupicola Lebel ex Le Jolis. Near Gateholm Island, Marloes, and Martin's Haven.
S. marginata (DC.) Kittel. Garron Pill.
S. rubra (L.) J. & C. Presl. Near Strumble Head.
Hypericum Androsaemum L. Minwear Wood.
Geranium lucidum L. Lawrenny.

Erodium maritimum (L.) L'Hérit. Martin's Haven.
Trifolium scabrum L. Fishguard.
Lotus uliginosus Schkuhr. var. *glaber* Bréb. Near Mathry.
Prunus domestica L. Carew.
Potentilla reptans L. var. *mollis* Borb. Near Marloes Mere and Treffgarne Rocks.
P. palustris (L.) Scop. Llanerch, Treffgarne Rocks and near Mathry.
Rosa tomentosa Sm. Llambed Farm, near Mathry [S.].
R. spinosissima L. Near Strumble Head.
**Callitriche intermedia* G. F. Hoffm. [S.], growing with the var. *pedunculata* (DC.) Druce. Near Mathry.
Peplis Portula L. Near Mathry and Llanerch.
Apium graveolens L. Carew and Haverfordwest.
A. inundatum (L.) Rchb. f. Near Mathry.
Carum verticillatum (L.) Koch. Near Gumfreston and near Redberth.
Oenanthe Lachenalii C. Gmel. Salt marsh by Minwear Wood.
Valeriana officinalis L. f. *dentatifolia* (Druce) Drabble. Near Treffgarne Rocks.
Achillea Millefolium L. var. *lanata* Koch. Near Strumble Head.
Inula Helenium L. Near Holloway Farm, near Tenby.
Petasites fragrans Presl. Lawrenny.
Senecio sylvaticus L. Broadhaven and near Strumble Head.
**Oxycoccus quadripetalus* Gilib. Near Llanerch, Gwaun Valley.
Samolus Valerandi L. Salt marsh by Minwear Wood and Martin's Haven.
Centaurium umbellatum Gilib. var. *subcapitatum* (Corb.) Gilmour. Strumble Head and Martin's Haven.
Menyanthes trifoliata L. Near Llanerch, near Treffgarne Rocks, and near Mathry.
Solanum Dulcamara L. var. *ovatum* Dunal. Near Gumfreston.
Linaria vulgaris Mill. A tall broad-leaved form, the leaves measuring 45-55 × 7-12 mm., near Strumble Head.
Digitalis purpurea L. var. *nudicaulis* Saunders. Near Strumble Head.
Veronica scutellata L. Near Mathry.
Euphrasia micrantha Rchb. With purplish flowers, Strumble Head [S.].
E. occidentalis Wettst. Broadhaven, Strumble Head and near Martin's Haven. The latter with unusually large flowers. Det. H. W. Pugsley.
E. confusa Pugsl. f. *albida* Pugsl. Near Mathry. Det. H. W. Pugsley.
E. brevipila Burnat & Greml. Canaston Wood. Det. H. W. Pugsley.
Pedicularis palustris L. Near Mathry.
Thymus neglectus Ronn. Strumble Head.
T. britannicus Ronn. Broadhaven, Strumble Head and near Marloes.
Satureia ascendens (Jord.) Druce. Lawrenny.
Prunella vulgaris L. A form with pale blue or pale bluish lilac flowers, abundant in pastures near Strumble Head.
Stachys officinalis (L.) Trev. var. *hirta* (Leyss.) Rouy. Strumble Head and near Marloes.
Galeopsis Ladanum L. var. *angustifolia* Pers. Railway track, Treffgarne Rocks.
Rumex crispus L. var. *trigranulatus* Syme. Carew.
*× *Ulmus hollandica* Mill. Carew.
Salix pentandra L. Near Letterston.
S. repens L. var. *fusca* (L.) Wimm. & Grab. Near Redberth.
Orchis latifolia L. sec. Pugsl. var. *pulchella* (Druce) Pugsl. Near Mathry. Near Llanerch, Gwaun Valley, det. P. M. Hall [S.].
O. ericetorum (Linton) Marshall × *latifolia* L. sec. Pugsl. var. *pulchella* (Druce) Pugsl. Near Llanerch, Gwaun Valley, det. P. M. Hall [S.].
Scilla verna Huds. Strumble Head.
Juncus effusus L. var. *compactus* Lej. & Court. Near Redberth.
Baldellia ranunculoides (L.) Parl. Near Mathry.
Potamogeton Berchtoldii Fieb. (*P. pusillus* auct.). Near Mathry.
Scirpus Tabernaemontani C. Gmel. Salt marshes by Minwear Wood and Fishguard.
S. cernuus Vahl. Marloes Mere.

S. fluitans L. Marloes Mere.
Carex rostrata Stokes in With. Near Mathry, near Llanerch and Treffgarne Rocks.
C. helodes Link. Near Llanerch and Canaston Wood.
C. distans L. Salt marsh by Minwear Wood.
C. Hostiana DC. (*C. fulva* Host non Good.). Near Llanerch.
C. extensa Good. Carew.
C. divulsa Stokes. Lawrenny.
C. paniculata L. Near Llanerch and Minwear Wood.
C. diandra Schrank. Near Mathry.
Anthoxanthum odoratum L. var. *villosum* Lois. Near Marloes.
Agrostis canina L. var. *mutica* Gaud. Near Treffgarne Rcoks.
Arrhenatherum tuberosum (Gilib.) Druce. Near Marloes.
Glyceria fluitans (L.) R. Br. var. *triticea* (Fr.) M. T. Lange. Marloes Mere.
Bromus lepidus Holmb. Near Strumble Head [S.].
Agropyron repens L. var. *Vaillantianum* (Wulf. ex Schweigg & Koerte) R. & S. Carew.
Asplenium marinum L. Strumble Head.
Athyrium Filix-foemina (L.) Roth var. *convexum* Newm. Treffgarne Rocks.

Specimens of most of the above are in the National Museum of Wales: some additional plants collected by Mr N. D. Simpson are indicated by "[S.]."

A. E. WADE.

July 15. Gloucestershire, v.-c. 33. A Day in the Neighbourhood of Gloucester. Joint Meeting with the Cotteswold Naturalists' Field Club. Leaders: Mr J. W. Haines and Mr G. B. Milne-Redhead.

Eleven members of the B.E.C. attended this excursion, the main object of which was to visit the Brick Pits at Walham, which is just outside Gloucester on the river bank near Sandhurst. The weather was unfortunately bad and much rain fell, but the spirits of the party were by no means damped. The brick pits, which are now disused and full of water, contain an incredible mass and variety of water plants. Waste ground in the neighbourhood was prolific in aliens. The following plants were observed:—*Ranunculus arvensis* L.; *Sisymbrium altissimum* L.; *Lepidium ruderale* L., abundant; *Coronopus didymus* (L.) Sm.; *Oenanthe aquatica* (L.) Poir.; *Erigeron canadensis* L.; *Senecio vulgaris* var. *radiatus* Koch, with very large flowers; *Lysimachia Nummularia* L.; *Epilobium adenocaulon* Hausskn. (an interesting alien first observed in Gloucestershire near Stroud during the last war and now spreading widely and hybridising with native species); *Myosotis palustris* (L.) Hill approaching var. *strigulosa* (Reichenb.); *Scutellaria galericulata*, *Carex Otrubae* Podp. (*C. vulpina* auct. non L.); and several Characeae which were taken by Mr Ash for further examination.

Lunch was taken under somewhat damp conditions, and the party then proceeded a short distance in the direction of Sandhurst to a pond where *Rumex maritimus* L. was found. The fruiting plants were of a striking golden appearance; their presence here seems to be due to their proximity to the brackish river Severn, a short distance away, though there is no water connection except in flood time. *Eleocharis multicaulis* Sm., the distribution of which is little known, as it is seldom recorded, was found round here.

A visit was then paid to some withy beds on the water meadows beyond Westgate Bridge, where the uncommon grass *Poa palustris* L. was seen. In a withy bed on the Gloucester side of Over Bridge Mr Ash found a plant of ×*Stachys ambigua* Sm.

A good tea was obtained at the Dog Inn at Over, after which the party divided. Mr Milne-Redhead took some members to visit the Cold Pool Nature Reserve at Badgeworth near Cheltenham, where *Ranunculus ophioglossifolius* Vill. is preserved by the Society for the Promotion of Nature Reserves. The preservation of this rare British plant is entirely due to the generosity of the late Mr G. W. Hedley of Cheltenham, former Secretary of the Botanical Sub-Committee of the C.N.F.C., who in 1933 purchased the pond when it was in imminent danger of being filled up. Since then the plant has been carefully preserved and systematic observations have been made of its biology and recorded in the Proceedings of the C.N.F.C. In good years when in full flower the whole pond is coloured with it, but such years are periodic and depend not only on the amount of rainfall, but more especially on its distribution. Unfortunately this year was not a good one.

Mr Haines took the remaining members to Crickley Hill, near Birdlip, now the property of the National Trust, where *Polygonatum officinale* All. and *Herminium Monorchis* (L.) R. Br. were seen. A large clump of *Galium erectum* Huds. was observed by the roadside at Ullenwood.

W. R. PRICE.

July 25th to 31st [to August 11th]. V.-c. 103. The Island of Mull. Leader, Mr J. F. G. Chapple. [Compiled by A. J. Wilmott.]

In addition to the leader, ten members took part, viz.:—Mrs Bull, Miss Cadbury, Mrs Evetts, Mrs Gomeral, Lady Edith Legard, Miss Swain, Miss Taylor, Mr Temperley, Mr Templeman, and Miss Vachell. A request for some account of the excursion was therefore sent to each of these, and the present compilation has been made from the replies received, which are now gratefully acknowledged. The most detailed account was sent by Mr Templeman, and this compilation is largely based on his MS., from which the quotations made have been taken.

Mr Chapple was mobilised soon after he returned from this excursion and is unable to prepare an account of it himself. He tells me that the specimens which he took for critical examination were sent to Mr Hall, but unfortunately they have not yet been found. A complete account cannot therefore be given of the botanical results, but as it is uncertain when the next Report will appear, it seemed better to prepare as good an account as possible now, rather than omit all description of this interesting expedition. A few specimens were given to the British Museum herbarium by Mr Templeman in January 1940, and others are in Herb. E. Vachell, but some of the records may require confirmation from the main series taken by the leader.

It is generally agreed that the whole excursion was admirably arranged and most enjoyable, and that John Chapple proved both an excellent leader and most capable organiser. Each evening after dinner members met at the Western Isles Hotel to discuss the day's finds and to make a list of all the plants seen. It is a great pity that Mr Chapple's data cannot be found, so that a suitable finish could be put on his efforts. The chartering of a bus for transport was generally approved, for it kept the party together and did away with unnecessary delays.

At selected spots the bus was stopped, and the members of the party explored lochs, marshes, or rocks at will. Unfortunately the weather was not fine and Ben More (3169 ft.) remained too continuously enshrouded in mist to be explored by the whole party.

July 25th. After lunch the bus conveyed the party to the high ground near Tobermory Reservoir, fully a mile above the town, where *Subularia aquatica*, *Pinguicula lusitanica*, and *Potamogeton alpinus* were among the plants found. The route thence was by Loch Peallach (with *Botrychium Lunaria*, etc., nearby) and the chain of Mishnish Lochs to Dervaig (near the head of Loch Cuan), where a salt marsh was found to contain *Scirpus rufus*, *Carex extensa*, and other interesting plants. The next stop, at Calgary Bay, provided the best botanising of the day, on the sands and also on the rocky shore on the north side, towards and beyond the pier.

July 26th. The party proceeded in the bus from Tobermory along the S.E. high road (with views over the Sound of Mull to Morven) to Aros and Salen, then across to and along the southern shore of Loch na Keal to the Gribun, obtaining on the way fine views of Inch Kenneth Island, Staffa, the Dutchman's Cap and other Treshnish Isles, etc., and observing *Saxifraga aizoides* and other hill plants on rocks by the roadside near sea-level opposite Eorsa Island. The road along Glen Seilisdeir was then followed to and around the shores of Loch Scridain via Kinloch, Pennyghael, and Bunessan to Fionphort and the Iona Ferry. On this granitic portion of the Island nothing of special interest was seen, but in the bogs *Pinguicula lusitanica*, *Drosera anglica*, *Anagallis tenella*, and *Schoenus nigricans* were noted. On the sands and granite rocks *Arctostaphylos Uva-ursi* was found in plenty. The party also examined Loch Poit ha h-I (with marsh plants, orchids and *Utricularia minor*, etc.) and the small and interesting boggy tarn of Loch an t'Suidhe, near Bunessan, where *Nymphaea alba*, *Cladium Mariscus*, *Rhynchospora alba*, *Carex limosa* and *C. lasiocarpa* were seen. On the way back, turning off by Pennyghael, Carsaig was reached, where *Campanula latifolia* and *Lepidium Smithii* were found. Returning to Pennyghael, the outward route was followed to Tobermory.

July 27th. A circular bus tour afforded a fine opportunity of seeing the island. The first stop was at Aros, where a few specimens of *Avena strigosa* were seen amongst the crop in a cornfield. The salt-marsh on the way to Aros Castle contained *Cochlearia anglica*, *Suaeda maritima* and *Salicornia herbacea*. Near Aros Cottage †*Cotoneaster microphylla*, †*Campanula Trachelium*, and *Sagina subulata* were seen, and on Aros Castle rocks *Sisymbrium Thalianum* was found. The bus continued via Salen across to the northern shore of Loch na Keal, where near Kellan several interesting plants were observed:—*Radiola Linoides* and *Centunculus minimus*, *Mimulus guttatus* and *M. moschatus*, *Carex distans*, also *C. Hostiana* and *C. flava*. *Galeopsis speciosa* was in fine condition in the fields. The motor then followed the coast road northwestwards (fine views of Ulva and Gometra Islands and the Treshnish Isles were obtained), past Torloisk with *Campanula latifolia*, *Quercus petraea* (*sessiliflora*), etc., in the woods, and over to Calgary Bay. The woods at Calgary produced *Cirsium heterophyllum*, *Dryopteris Linneana* and *D. Phegopteris*, etc. A second search on the north shore of Calgary Bay produced some additional species, including *Sagina apetala*, *Ligusticum scoticum*, *Carlina vulgaris*, and *Orobanche rubra* growing on *Thymus* on the slopes above the rocks. The return was made via Dervaig and the Mishnish Lochs.

July 28th. The day was spent in visiting Loch Spelve and Loch Buie in the south-east of the Island, a district which promised well, but the climatic conditions made plant-hunting very difficult. Botanising a short distance up Glen Lirein from Oakbank, *Osmunda regalis*, *Galium boreale*, oak and beech ferns, etc., were found. On the shore and cliffs at Loch Buie the finds included †*Meconopsis cambrica*, *Corydalis claviculata*, *Geranium pratense* (plentiful near the old castle), *Scirpus maritimus*, *Cystopteris fragilis*, *Asplenium marinum* and *A. Trichomanes*. Return was made over the same route.

July 29th. The route taken was via Salen and the south shore of Loch na Keal round the foot of Ben More. Near Balnabard, marsh and sands by the shore produced *Parnassia palustris*, *Oenanthe Lachenalii*, and *Gentiana campestris* var. *baltica*. The party had the pleasure of seeing some mountain plants at last, by climbing into the mist to explore the Gribun rocks at the base of the Ben More massif. Near sea-level there occurred *Silene acaulis*, *Sedum Rosea*, *Saxifraga aizoides*, and *Asplenium marinum*. At the foot of the rocks of Creag Brimishgan were *Saussurea alpina* in unusual abundance and beauty, with *Carex Bigelowii* (*C.* "*rigida*") and Saxifrages—*S. aizoides*, *S. platypetala*, *S. oppositifolia* and *S. stellaris*—all below 1000 ft. O.D. *Trollius europaeus* and *Cirsium heterophyllum* were also seen. Some members of the party ascended to the top of Dunan nan Nighean, finding *Schoenus nigricans*, carices, and bog plants, etc. On the way down by the waterfall to Derryquaig, much ivy of a narrow-leaved variety was seen on the streamside rocks, also several subalpine plants noted above.

July 30th. In the morning some members of the party explored the grounds of Aros House (the " Drumfin Woods " of G. Ross's " Flora of Mull ") and saw " an interesting woodland flora, including *Pyrola minor* (not *P. media*), *Neottia Nidus-avis*, *Rubus saxatilis*, *Cirsium heterophyllum*, *Veronica montana*, beech and oak ferns, *Prunus Padus*, *Circaea intermedia* (not *C. alpina*), *Carex sylvatica* and *C. remota*, *Milium effusum*, *Poa nemoralis*, *Calamagrostis epigeios*, and other ferns and grasses, etc. The introduced shrubs included *Pernettya*, *Andromeda* *japonica*, etc. *Juncus macer* was seen on a pathway and both yellow and white water-lilies in the lake (Lochan a Ghurabain)." In the afternoon several of the party proceeded on foot from Tobermory over by the Golf Course (with *Juncus macer*) towards the lighthouse and along the cliffs towards Bloody Bay. Here along the sea-cliffs there was a good show of *Sedum Rosea*, *Juniperus*, sea-pinks, sea-campions, etc., and a few interesting bog and marsh plants were found a short distance inland.

July 31st. The excursion ended, and most of the party returned by the morning boat from Tobermory. Mr Templeman, however, remained until Aug. 1st, and after visiting Iona from Aug. 3rd to 7th, returned to Tobermory from Aug. 8th to 11. As Mull has been so little explored and his explorations arose out of and continued the work of the official expedition, the results of his further stay are appended to the account of the excursion proper, and the plants noted included in the list of plants found, but within ( ). On the 31st, Mr Templeman and Mr Temperley examined some of the lochs and bogs around Tobermory, but found none of them to compare with the small tarn near Bunessan. They set off through the Aros Woods and up by the large waterfall to Loch nam Miol, and Glac Uamharr (with *Nymphaea occidentalis*, *Drosera anglica*, *Pinguicula lusitanica* and *Rhynchospora alba*) to Loch na Crithe and Caol Lochan (*Nymphaea occidentalis*). *Carex pauciflora* was found in this vicinity with other bog plants, and they had a good view of about 40 red deer as they proceeded direct to Loch Peallach. They ascended to Lochan's Airde Beinn, where *Lobelia Dortmanna* and *Littorella* were found, and on the way down to Tobermory they saw *Lycopodium Selago*.

August 1st. Mr Temperley left Mull, and Mr Templeman, left alone, went by the Iona Ferry bus from Tobermory to the N.W. base of Ben More on the shore of Loch na Keal, and decided to take the most direct route to the summit on account of the dense mist (and rain), which was down to about 800 ft. O.D. at mid-day and rarely above 1000 ft. for the rest of the day, with visibility about 60-100 yards. He followed the Abhainn Dhiseig above Dishig, a shallow gorge with steep sides in places and several waterfalls. "In the lower part were Rowan, Honeysuckle, many ferns (including *Dryopteris Phegopteris*, *Dryopteris Oreopteris*, and *Cystopteris fragilis*), with *Solidago* and *Hieracia*, *Antennaria dioica*, *Galium boreale* and Juniper. Higher upstream, but below a triple curtain fall at about 1250 ft., *Trollius europaeus*, *Cochlearia* sp., *Alchemilla alpina* and *A. vulgaris*, *Geum rivale*, *Valeriana officinalis*, *Saxifraga stellaris*, *Cirsium heterophyllum*, *Crepis paludosa*, *Oxyria*, *Festuca vivipara*, etc. Above the curtain falls the stream doubles for a short distance to several more falls, one of 25-30 ft., on the S.W. side of which was a fine patch of *Saussurea alpina*, also *Lycopodium Selago*, *Vaccinium Vitis-idaea*, etc. Higher still was a good spring on the S.W. side of the gorge with much *Cochlearia alpina* (large and small forms), *Epilobium alsinifolium* and *Saxifraga stellaris*, also *Trollius* and *Rubus* *saxatilis.* Still higher was another fall of about 30 ft., near which was another patch of *Saussurea alpina* with *Cochlearia alpina* and much *Thalictrum alpinum.* On the opposite—N.E.—bank were a few small plants of *Cryptogramma crispa.* From here to the top of the gorge nothing new was found, but on the way up to this point the bog and heath plants seen included *Carex pallescens* and *Scirpus pauciflorus*; *Saxifraga oppositifolia* may have been overlooked owing to poor light. Above the gorge at the foot of Coire nam Fuaran the ground was wet and marshy with springs and water runnels, and bore *Caltha radicans*, *Polygonum viviparum*, etc., and nearby were *Salix herbacea*, *Luzula spicata*, *Carex Bigelowii*, and some plants of *Sedum anglicum*, *Alchemilla alpina*, etc. The grassy slopes continued upwards for a few hundred yards to the screes which had to be crossed before reaching the ridge to the summit. On and among the screes was a scanty vegetation of mosses and lichens, with sporadic plants or small patches of *Alchemilla alpina*, *Armeria maritima*, *Silene maritima*, *Silene acaulis*, *Cochlearia alpina*, *Oxyria digyna*, *Arabis petraea* (fine), *Saxifraga stellaris*, *Vaccinium Myrtillus*, *Galium saxatile*, *Festuca vivipara*, *Sedum Rosea*, *Plantago maritima* and *Cryptogramma crispa.*" Above the screes, on the long gentle ridge to the summit, several of these species were seen, and also *Salix herbacea*, *Luzula spicata* and *Carex Bigelowii.* Close to the summit cairn *Arabis petraea* and *Alchemilla alpina* grew. The weather being still wet and misty, descent was made by the same route to the top of the Dhiseig gorge, then over An Gearna, and across the Abhainn na-h Uamha near the waterfall to the shores of Loch na Keal, the only additions to the day's list being *Drosera anglica*, *Melampyrum pratense* var. *montanum*, *Schoenus nigricans*, and *Rhynchospora alba.* While waiting for the bus to Tobermory at Knock *Centunculus minimus* was found close to the Benmore Lodge entrance gate.

August 4th. The ferry was taken from Iona to Fionphort on Ross of Mull and a route taken by Fidden and across the estuary to Erraid Sound, *Centunculus minimus*, *Scirpus setaceus*, etc., being found. Thence Mr Templeman proceeded inland by Knockvologan to Linne nan Ribheid, and *Nymphaea alba*, *Carex limosa*, *Hypericum elodes*, *Utricularia intermedia ?* (" *ochroleuca* ") and other bog plants were observed. On the way from this loch to Loch Poil and Fionphort, much *Osmunda regalis* was seen by the streamside near Toba Bhreaca. Mr Templeman notes that he failed to find *Eriocaulon* on Iona or Mull.

August 8th. " A traverse was made over Ben More, as much for the views from the summit and the interesting geological structure as for the flora. The Iona Ferry bus was taken to Dercraeth on Loch Scridain. Thence the south slope of Ben More was ascended by the Alt nan Fiadh on the west side of Am Binnein, then by the west side of Coire nan Each to the Maol nan Damh and the S.W. shoulder of Ben More. On the slopes and rocks of Coire nan Each were *Sagina subulata*, *Teesdalia nudicaulis* (with 6 stamens), *Veronica officinalis*, *Thymus ovatus*, and other montane species already noted. The screes and southern ridge to the summit bore many of the species on the N.W. ridge, and *Vaccinium Vitis-idaea*, also *Carex pauciflora* on the S.W. shoulder. There were marks of red-deer hooves at the summit. Descent was made by the N.W. ridge to the N.E.-facing rocks with screes below. These rocks were rather dry but yielded most of the species already noted at this elevation and also *Saxifraga hypnoides*, *Empetrum nigrum* and *Deschampsia alpina*. Thence the saddle north of A' Chioch was crossed to the head of Glen Clachaig (with a herd of about 60 red deer). In this glen only common bog and marsh plants were found. Loch Ba contained *Lobelia* and *Littorella*, and *Drosera anglica* alongside. Return from Knock by bus to Tobermory."

August 9th. "The Iona Ferry bus was taken to Kilfinichen Bay on Loch Scridain, and a walk made round the Gribun Peninsula to Balmeanach. After passing Tiroran, *Carlina vulgaris* was seen near Scobull, and *Sagina nodosa* with *Centunculus minimus* on road margins from Scobull to Culliemore and Burg. Near Tavool House were *Sanicula europaea, Hypericum Androsaemum*, †*Chrysanthemum Parthenium*, and *Verbascum Thapsus*. West of Burg and round to the S.W. cliffs were *Hypericum quadrangulum*, more *Carlina*, *Eupatorium cannabinum*, *Asplenium marinum* and *A. Adiantum-nigrum*. There was more *Eupatorium* on the columnar basalt near MacCulloch's Fossil Tree. From this point—the Rudha na-h'Uamha—before rain started, fine views were obtained of the Ross of Mull, Iona, Staffa, and the Treshnish Isles. The Wilderness, an area of landslips and boulders, produced *Cochlearia officinalis* and plentiful *Parnassia*, and several patches of *Vicia sylvatica* were noted on steep grassy banks above the sea, probably near Na Goirteanan. The steep banks and rocks near a waterfall below and north of the cliffs of Ton Dubh-sqairt produced a few patches of *Dryas octopetala* (500-600 ft. O.D.), also *Epilobium alsinifolium*, *Circaea alpina*, *Saxifraga aizoides*, *S. oppositifolia*, etc. This locality deserved more time than could be spared on the hurried walk to Balmeanach to catch the bus, during which *Asplenium Adiantum-nigrum*, *A. Ruta-muraria*, and *A. Trichomanes* were all noted."

August 10th. The day was devoted to the long motor tour from Tobermory through Glen More from Loch Beg to Lochs Spelve and Buie, and back by Lochdonhead and Craigmure. No new plants were seen.

August 11th. "The Iona Ferry bus was taken to Port nam Beach on the south shore of Loch Scridain, whence Beinn Creagach was crossed via Beach and Eas Mor, descent being made to Traigh Cadh'an Easa. On the top of the cliffs above Carsaig Arches *Sagina subulata* and *Daucus Carota* were among the plants noted, and *Lobelia* and *Littorella* occurred in tarns near the cliff tops. *Isoetes lacustris* was collected in the lochan near A. of Aoineadh Mor on the 1 in. map, and *Heleocharis palustris* occurred in another loch near by. Pennyghael was reached by descending the Nun's Pass and along Sron nam Boc to Carsaig Bay, and thence by Glen Leidle. *Lythrum Salicaria* and *Lycopus europaeus* were observed on the shore of Loch Scridain, while waiting for the bus to Tobermory. The fine coast scenery and a close (10 yard) view of a buzzard relieved a rather uninteresting day botanically."

It is unfortunate that the original lists made each evening in Mull, and the voucher specimens collected together by Mr Chapple, have not yet been traced. The greater part of this list is compiled from the detailed account received from Mr Templeman, which is frequently confirmed by accounts from others. There seems no reason to doubt most of the records which would be new to v.-c. 103, and as most of them, if not all, will be represented in the collection and can be confirmed later, they are accepted here unless for any special reason they are left for confirmation, for many of the original records in *Top. Bot.* rested on similar lists prepared by travellers, the results of which were sometimes accepted and sometimes queried by Watson.

The checking of the N.C.R.s revealed an unbelievable amount of carelessness in the preparation of *Top. Bot.*, ed. 2, P. Ewing's *Glasgow Catalogue*, ed. 2 (1899), and the *Comital Flora*. Mr George Ross's paper " On the Flora of Mull " (1878: in *Bot. Soc. Edinb., Trans.* xiii, 234-242) is often cited in *Top. Bot.*, ed. 2, as " Ross cat."—at least, I presume this citation to refer to that work—but an incredible number of species listed by Ross were either overlooked or deliberately ignored by Watson, even when there is no reason to doubt them and the species are said by Ross to be " Common." Species mentioned in the following list which suffered thus are:—*Sisymbrium Thalianum*, *Cerastium semidecandrum*, *Arenaria trinervia* (" common "), *Spergularia rubra* (" common "), *Oenanthe crocata* (" common "), *Crepis paludosa* (" common "), *Lysimachia nemorum* (" common "), *Anagallis tenella*, *Veronica serpyllifolia* (" common "), *Salicornia herbacea*, *Juncus Gerardi* ("frequent"), *Triglochin palustre* (" common "), *Scirpus setaceus*, *Milium effusum*, and *Equisetum sylvaticum* (" common "). When this has occurred, Ross's records have been permanently lost till now, as nobody seems to have checked over his list again. *Milium effusum* is an example of this, the plant remaining unrecorded by anyone else. Ewing's *Glasgow Catalogue*, ed. 2, appears to be a work on independent lines, based on material actually seen by the author; " Ewing " is there cited largely under vice-counties for which the species had been previously recorded, and the citations must therefore not be taken as indicating the first records. Many Mull records are due to Ewing, however, but unfortunately they are not given with proper indication of locality, and are mostly mere citations of " Mull, Ewing," in his Contributions to the Topographical Botany of the West of Scotland (*Nat. Hist. Soc. Glasg., Trans.*, New Series, 1888—ii, 309-321; 1890—iii, 161-165; 1895—iv, 199-214). Some of these records are due to Kidston. I have, however, not been able to trace any papers on the Flora of Mull since that by Ross. The *Comital Flora* carries on many of the errors of *Top. Bot.*, but a number of species are recorded for v.-c. 103 which are not in *Top. Bot.* or *Supps.* or in Ewing's *Catalogue*. What the authority for these records may be is not obvious, and indicates the unsatisfactory nature of such abbreviated compilations, statements in which are capable of neither verification nor denial. I do not find—from turning over the pages of our Reports—that Dr Druce ever visited Mull (or v.-c. 103), but it seems unlikely that he left any vice-county completely unvisited, and the records in the *C.F.* may prove to be vouched for by specimens in his herbarium, and this matter needs investigation. One thing is quite certain: all records for v.-c. 103 should be revised as soon as conditions permit.

Since the above was written, Miss Vachell has sent me some specimens from her herbarium collected in 1905 during a visit to Mull by her and her father. Ben More was ascended, and the specimens include *Thalictrum alpinum* L., *Arabis petraea* Lam., and *Luzula spicata* (L.) DC. from Ben More, *Subularia aquatica* L. and *Pyrola media* Sw. from Loch Frisa and surrounding heath, and *Scirpus fluitans* L. from Glen Forsa. The specimen of *Luzula spicata* was so determined by Dr Druce, but no notice was taken of it in *C.F.* The records for 103 added in *C.F.* are therefore not due to this source, but they may have arisen from other material sent to Dr Druce for examination. The compiler would be glad to receive information concerning collections made in Mull or papers published on its flora.

In this list, the number in brackets refers to the date, thus enabling the list to be easily related to the account of the excursion. Except for some special reason, all species stated by Ross (1878) to be common in Mull have been omitted. Records made by Mr Templeman after the excursion proper was over are placed in brackets. The notes in square brackets have been made by me as a result of work done while putting this list together. All mention of "*Top. Bot.*" refers to the second edition (1883).

A. J. WILMOTT.

2/2(2). *Thalictrum arenarium* Butcher. Calgary Bay (25). [Recorded by Ross, 1878, as *R. minus* var. *maritimum*.]

2/5. *T. alpinum* L. (Ben More, Abhuinn Dhiseig and Coire nam Fuaran (1), Coire nan Each (8).) [Not listed by Ross, 1878, although sent by him to the Botanical Locality Record Club from Ben Buy, 1877, and noted as "Ross. rec." in *Top. Bot.*!]

6/11. *Ranunculus sceleratus* L. Kellan (27); on shore at foot of Gribun rocks (29, Temperley). [Listed by Ross, 1878, but omitted by Ewing, 1899!]

7/2. *Caltha radicans* T. F. Forst. (Ben More, Coire nam Fuaran (1).)

8/1. *Trollius europaeus* L. Creag Brimishgan (29); (Ben More, Abhuinn Dhiseig (1); Gribun Peninsula (9)). [Ross says it is very common all over the north end of the island and apparently so in the south.]

20/1c. *Nymphaea occidentalis* (Ostenf.) Moss. (Glac Uamharr and Caol Lochan (31).) [Needs confirmation by specimens before accepting as N.C.R.]

22/1. *†*Meconopsis cambrica* (L.) Vig. Loch Buie (28). [Will no doubt be confirmed by the specimen.]

31/1. **Corydalis claviculata* (L.) DC. Loch Buie (28). [Will no doubt be confirmed by specimen.]

37/5. *Arabis petraea* Lam. (Ben More, screes of Coire nam Fuaran and near the Summit Cairn (1), south screes and summit ridge, also north-east (dryish) rocks (8).) [Recorded for v.-c. 103 without exact locality by Ewing, 1899, presumably from Mull.]

45/3. "*Cochlearia alpina* (Sweet) Wats." (Ben More, gorge of Abhuinn Dhiseig and screes of Coire nam Fuaran (1), Coire nan Each and north-east (dryish) rocks (8).) [If correctly named, these would be N.C.R., but they are possibly all the following.]

45/4. *C. micacea* E. S. Marshall. (Ben More, Coire nam Fuaran (1, as *C. alpina*). A specimen in Herb. Mus. Brit. is certainly *C. micacea* E. S. Marshall; A. J. Wilmott.)

45/5. *C. anglica* L. Salt marsh near Aros Castle (27). [N.C.R. if confirmed by specimen.]

49/7. *Sisymbrium Thalianum* (L.) Gay. Aros Castle rocks (27). [The record by Ross, 1878, for "Rocks by the sea, Tobermory"—as *Arabis thaliana* L.—has been completely ignored in *Top. Bot.* and *Supps.*, Ewing, 1899, and *C.F.*: add to *C.F.*]

53/1. *Subularia aquatica* L. Tobermory Reservoir (25).

61/7. *Lepidium Smithii* Hook. Carsaig (26).

66/1. **Teesdalia nudicaulis* (L.) R. Br. (Ben More, Coire nan Each (8). Specimen in Herb. Mus. Brit.)

96/1. *Silene maritima* With. Frequent on shore, as Ross says (1878), but also seen in the corries and on the summit ridges of Ben More (1 and 8).

96/8. *S. acaulis* L. Near sea-level on the north side of Ben More (29); (also high in Coire nam Fuaran (1)).

100/8. *Cerastium semidecandrum* L., believed to have been collected: would not be N.C.R. although not in *Top. Bot.* or *C.F.*, as Ross (1878 : 237) gives it for "Runa Leapa."

102/1. *Arenaria trinervia* L. Mentioned in Mrs Evetts' list, is not in *Top. Bot.* nor *C.F.*, but is given by Ross (1878 : 237) as "Common."

103/1. *Sagina nodosa* (L.) Fenzl. (Gribun Peninsula, road margins between Scobull and Burg (9).) (Also in Mrs Evetts' list.)

103/2. *S. subulata* (Sw.) Presl. Near Aros Cottage (27); (Coire nan Each (8); cliffs above Carsaig Arches (11)).

103/8. [*S. apetala* Ard. requires confirmation by specimen. North side of Calgary Bay (27). N.B.—*S. maritima* Don is given in *Top. Bot.*, ed. 2 (also Ross, 1878), and Ewing, 1899, but omitted from *C.F.*: *S. apetala* would be N.C.R.]

105/5. *Spergularia rubra* (L.) J. & C. Presl. In Mrs Evetts' list. ["Common," Ross, 1878, but omitted from *Top. Bot.*, ed. 2. Recorded for 103 by Ewing (1899 : 22), but requires to be added to *C.F.*]

112/1. *Hypericum Androsaemum* L. North side of Calgary Bay (25). ["Frequent"; Ross, 1878.]

112/11. *H. quadrangulum* L. (*H. tetrapterum* Fr.). (Gribun Peninsula, west of Bury (9).)

112/17. *H. elodes* L. Lochan t-Suidhe, near Bunessan (26); (Ross of Mull, Linne nan Ribheid (4)).

124/1. *Radiola Linoides* Roth. Fionphort (26), near Kellan (27).

127/1. *Geranium sanguineum* L. Calgary Bay (25), where it was recorded by Ross.

127/4. *G. pratense* L. Loch Buie, plentiful near old castle (28).

128/3. *Erodium cicutarium* (L.) L'Herit. (Gribun Peninsula, west of Bury (9).)

176/1. **Vicia sylvatica* L. (Gribun Peninsula, "several patches" below Ton Dubh Sgairt, S.W. of Balmeanach (9): sp. in Herb. Mus. Brit.)

183/2. *Prunus Padus* L. Aros House woods (30). ["Frequent"; Ross.]

186/1. **Dryas octopetala* L. (Gribun Peninsula, a few patches near waterfall c. 500 ft. O.D. north of Ton Dubh Sgairt, S.W. of Balmeanach (9): spec. in Herb. Mus. Brit.)

189/11. †*Potentilla norvegica* L. Old stone pier near entrance to Aros House grounds (25).

190/19. *Alchemilla alpina* L. To the summit of Ben More and also seen at low elevations.

197/2. †*Cotoneaster microphylla* Wallich. Near Aros Cottage (27). [This, and possibly also *C. Simonsii* Baker, await confirmation from the collection.]

199/1. *Saxifraga aizoides* L. Rocks by roadside near sea-level opposite Eorsa Island (26); Creag Brimishgan (Gribun Rocks) (29).

199/2. *S. oppositifolia* L. Creag Brimishgan (Gribun Rocks) below 1000 ft. (29); (Gribun Peninsula, north of cliffs of Ton Dubh Sgairt (9) : [not in *Top. Bot.* or *Supps* , nor in Ewing, 1899, for 103, but in *C.F.*, record untraced].

199/7. **S. platypetala* Sm., det. A. J. Wilmott. Below Creag Brimishgan, south side of Loch na Keal (29 : spec. in Herb. Mus. Brit. coll. A. Templeman, as *S. hypnoides*).

199/10. [*S. hypnoides* L., see preceding. Also listed for N.E. rocks of Ben More (8) and Gribun Peninsula, N. of cliffs of Ton Dubh Sgairt (9), but needs confirmation of specimens in view of the preceding record.]

199/23. *S. stellaris* L. Creag Brimishgan (Gribun rocks) below 1000 ft. (29): (Ben More, gorges, screes and summit ridges (1, 8); also Gribun Peninsula, north of cliffs of Ton Dubh Sgairt (9)).

205/1. *Parnassia palustris* L. In many places. [" Common "; Ross.]

211/11. *Sedum anglicum* Huds. [" Common "; Ross.] (High on Ben More, Coire nam Fuaran (1) and Coire nan Each (8).)

211/22. *S. Rosea* (L.) Scop. General on cliffs of sea and mountains (to the summit ridge of Ben More (8)).

213/1. *Drosera anglica* Huds. In many localities; near Fionphort (26), Glac Uamharr (31), etc.

219/1. *Lythrum Salicaria* L. Loch Buie (28); (shore of Loch Scridain near Pennyghael (11)). [" Frequent " : Ross.]

220/12. **Epilobium alsinifolium* Vill. (Ben More, spring above middle falls, Abhuinn Dhiseig gorge, on north-west side (1); Gribun Peninsula, north of cliffs of Ton Dubh Sgairt (9); specimens of both in Herb. Mus. Brit.)

225/1. *Circaea lutetiana* L. [This is listed by Ross in 1878, but Mr Templeman suggests that the plant in Aros (Drumfin) Woods is *C. canadensis* Hill (' *C. intermedia* "), which would be N.C.R. Must await examination of the collection.]

225/3. *C. alpina* L. (Gribun Peninsula, north of cliffs of Ton Dubh Sgairt (9), whence a specimen in Herb. Mus. Brit.) [Not N.C.R., as thought by Mr Templeman, for it is recorded by Ewing (1899 : 55) as " Ewing." This record does not, however, appear to be mentioned in any of Ewing's previous papers (1888, 1890 and 1895), and must therefore, presumably, be supported by a specimen in his herbarium. This specimen should be examined again, in view of the frequent confusion of *C. alpina* with *C. canadensis*, and if Ewing's specimen is really *C. alpina*, the proper details of the record should be published. Records published thus without adequate details are most unsatisfactory.]

265/6. *Oenanthe Lachenalii* G. Gmel. Near Balnahard (29).

271/1. *Ligusticum scoticum* L. North side of Calgary Bay (25); Fionphort (26).

284/1. *Hedera Helix* L. A narrow-leaved variety occurred in plenty on streamside rocks by the waterfall on the way down from Dunan nan Nighean to Derryquaig (29).

296/1. *Galium boreale* L. Glen Linein (28); Creag Brimishgan (29); (etc.).

310/1. **Eupatorium cannabinum* L. North side of Calgary Bay (25); (Gribun Peninsula, west of Burg and on columnar basalt near MacCulloch's fossil tree (9)). [Will presumably be confirmed by specimen in collection.]

370/13. †*Chrysanthemum Parthenium* (L.) Bernh. (Gribun Peninsula, near Tavool House (9).)

391/1. **Carlina vulgaris* L. North side of Calgary Bay (27); (Gribun Peninsula, near Scobull and west of Bury (9)). [There will, presumably, be a specimen in the collection, but in any case there seems no reason to question this N.C.R.]

396/3. *Cirsium heterophyllum* (L.) Hill. Seen in several localities. [" Frequent "; Ross.]

401/1. *Saussurea alpina* (L.) DC. Creag Brimishgan (Gribun rocks) below 1000 ft. (29); (Ben More, Abhuinn Dhiseig, by middle and upper falls and at the top of the gorge (1)).

431/1. *Lobelia Dortmanna* L. Tobermory Reservoir (25), etc. [" Common in all the lochs "; Ross.]

435/2. **Campanula latifolia* L. Carsaig (26); Torloisk (27). [There will, presumably, be a specimen of this in the collection : there seems no reason to question this N.C.R.]

435/3. †*C. Trachelium* L. Near Aros Cottage (27), (no doubt only garden escape : not previously recorded).

438/2. *Vaccinium Myrtillus* L. (Ben More, high screes and summit ridge (1, 8).)

438/3. *V. Vitis-Idaea* L. (Ben More, Abhuinn Dhiseig, middle fall (1), also south screes, summit ridge and dryish north-east rocks (8).) [? really N.C.R. Recorded in *Top. Bot.*, ed. 2, as " Ross *cat.*", but in error : it is not mentioned by Ross, 1878 ! Referred by Ewing (1899 : 85) to " Ross," presumably copied from *Top. Bot.*—although it must be admitted that he more often ignores the " Ross *cat.*" of *Top. Bot.* and cites " Ewing " instead. In *C.F.*, but perhaps also from the *Top. Bot.* error.]

441/1. *Arctostaphylos Uva-ursi* (L.) Spr. Fionphort (26) " in plenty."

453/3. *Pyrola minor* L. Aros (Drumfin) Woods (30).

458/4. *Armeria maritima* Willd. Common on cliffs (and summit ridges and screes of Ben More).

468/1. *Centunculus minimus* L. Near Kellan (27); (Knock, close to Benmore Lodge entrance gate (1); Ross of Mull, Erraid Sound (4); Gribun Peninsula, road margin between Scobull and Burg (9)).

480/9. *Gentiana campestris* L. In several localities. [" Common "; Ross.] The var *baltica* (Murb.) Druce was collected by E. Vachell on the shore near Balnabard (29).

497/1. *Symphytum officinale* L. (Gribun Peninsula, near Tavool House (9).)

505/1. *Mertensia maritima* (L.) S. F. Gray. In small quantity on the sands of Calgary Bay (25). [This confirms the record by Ross, 1878, as " Quinish (Miss H. A. Bird) "—*Top. Bot.*, ed. 2, gives " 103 " without authority, and Ewing (1899 : 91) puts " 103. ? "; in *C.F.*]

527/3. **Verbascum Thapsus* L. (Gribun Peninsula, near Tavool House (9).) [No specimen, but there seems no reason to question this N.C.R.]

537/1. **Mimulus guttatus* DC. Dervaig (25); Kellan (27). [Ross (1878) has " *M. luteus* L. Salen burn, Drumfin, &C.", which might be this or the following, otherwise N.C.R.]

537/2. *M. moschatus* Dougl. Kellan (27). [Must await confirmation from the collection.]

548. *Rhinanthus*. [What is most likely to have been *R. borealis* (Stern.) E. S. Marshall was noted by Mr Templeman in Coire nam Fuaran, on the N.W. side of Ben More, but unfortunately no specimen was collected.]

550/3. *Orobanche rubra* Sm. Calgary Bay, on Thyme above rocks (27).

553/4. *Pinguicula lusitanica* L. Seen in several places, confirming Ross's " frequent."

559/1. **Lycopus europaeus* L. Kellan (27); (by Loch Scridain near Pennyghael (11)). [It is hoped that there is a specimen of this N.C.R. in the collection.]

572/1. *Scutellaria galericulata* L. Loch Buie (28); (by Loch Scridain near Pennyghael (11)).

572/2. *Scutellaria minor* Huds. Near Fionphort (26).

578/1. *Galeopsis speciosa* Mill. Kellan (fine in fields) (27).

604/4. **Beta maritima* L. Calgary Bay, in small quantity (25). [It is hoped that there is a specimen of this N.C.R. in the collection.]

611/4. *Salicornia herbacea* L. Salt marshes near Dervaig (25) and Aros Castle (27). [Not N.C.R. although not in *C.F.* *S. herbacea* sensu lato was recorded by Ross in 1878; *S. herbacea* sensu stricto and of *C.F.* is not likely to be the form found during the excursion, which would in any case be too young for critical determination.]

612/2. *Suaeda maritima* (L.) Dum. Salt marsh near Aros Castle (27).

613/1. *Salsola Kali* L. Calgary Bay (25) [the only locality cited by Ross, 1878]; also Loch Buie (28).

615/4. **Polygonum viviparum* L. (Ben More, Coire nam Fuaran (1); specimen in Herb. Mus. Brit.)

615/13. *P. Raii* Bab. Calgary Bay (25).

617/1. *Oxyria digyna* (L.) Hill. (Ben More, in several places on high rocks (1, 8).)

646/2. *Quercus petraea* Lieblein, (*Q. sessiliflora* Salisb.). Torloisk (27). [Will be N.C.R. if there is a confirmatory specimen. Ross (1878 : 240) has " *Q. Robur*, L. Common."]

650/18. *Salix herbacea* L. (Ben More, high corries, screes and summit ridges (1, 8).)

662/1. **Neottia Nidus-avis* (L.) Rich. Aros House (Drumfin) Woods (30). [There will, presumably, be a confirmatory specimen in the collection.]

663/2. *Listera cordata* (L.) R. Br. (Aros Woods, sparse over about 100 yards square, among *Vaccinium Myrtillus* and a few seedlings of *Gaultheria Shallon*, under beech and rowan " (2).) [Not in *Top. Bot.* or *Supps.*, nor in Ewing, 1899; in *C.F.*, evidence not stated or yet traced : otherwise N.C.R.]

667/3. [*Cephalanthera longifolia* (Huds.) Fritsch, (*C. ensifolia* (Murr.) Rich.). Mr Templeman remarks that he was unable to find this in the Aros woods, though it is cited by Ross (1878 : 240—" Drumfin Wood, east side of Loch-na-Gourapin."). *Top. Bot.*, ed. 2, cites " Isle of Mull," but Ewing, 1899, puts " ? "; perhaps he, like Mr Templeman, had been unable to find it. Although accepted in *C.F.*, the record needs confirmation and search at the right time of the year.]

674/4. *Coeloglossum viride* (L.) Hartm. Near Fionphort, several plants by the roadside (26).

718/4c. *Juncus effusus* f. *spiralis* McNab. (Glen Clachaig, on N.E. side of Ben More (8).)

718/15. *J. Gerardi* Lois. Near Dervaig (25); Loch Buie (28); (shore of Loch Scridain near Pennyghael (11)). [Omitted from *Top. Bot.*, ed. 2, although Ross (1878 : 241) says " Frequent . . . on the shore " and cites localities.]

718/16. **J. macer* S. F. Gray, (*J. tenuis* Willd.). Aros House grounds, on a pathway (30), and by Tobermory Golf Course (30). [There will be, presumably, a specimen in the collection.]

719/8. **Luzula spicata* (L.) DC. (Ben More, Coire nam Fuaran (1); specimen in Herb. Mus. Brit.; previously collected by Miss Vachell in 1905.)

722/5. " *Sparganium minimum* " Fries. Tobermory Reservoir (25). [It is to be hoped that identifiable material was collected. Ross (1878 : 240) records " *S. natans*, L." from a single locality, which is presumably what is cited in *Top. Bot.*, ed. 2, under *S. minimum* as " Ross *cat.*" Ewing (1899) and *C.F.* both put 103 for *S. minimum* and have no record for *S. affine* Schnitzl., but from my own experience I should have expected the latter rather than the former.]

737/5. *Potamogeton alpinus* Balb. Tobermory Reservoir (25).

745/2. *Heleocharis uniglumis* (Link) J. A. Schultes. Head of Loch Cuan, near Dervaig (25; Mr Temperley).

745/3. *H. multicaulis* (Sm.) Sm. Salt marsh near Dervaig (25; Mr Templeman). [? both species there, or two determinations of one plant, presumably in the collection. Neither would be N.C.R.]

746/2. *Scirpus maritimus* L. Head of Loch Cuan near Dervaig (25); Loch Buie (28).

746/4. *S. Tabernaemontani* Gmel. Head of Loch Cuan near Dervaig (25).

746/8. *S. pauciflorus* Lightf. (Abhuinn Dhiseig, Ben More (1).)

746/11. *S. setaceus* L. Kellan (27); (Ross of Mull, Erraid Sound (4)).

746/15. *S. rufus* (Huds.) Schrad. Head of Loch Cuan near Dervaig, in salt marsh (25). [" Frequent "; Ross, 1878.]

748/2. *Rhynchospora alba* (L.) Vahl. Loch an t-Suidhe, near Bunessan (26), and in several other places. [" Frequent "; Ross.]

749/1. *Schoenus nigricans* L. North side of Calgary Bay (25); near Fionphort (26); etc. [" Frequent "; Ross.]

750/1. *Cladium Mariscus* (L.) R. Br. Loch an t-Suidhe, near Bunessan (26).

753/8. *Carex lasiocarpa* Ehrh. Loch an t-Suidhe, near Bunessan (26).

753/10. **C. pendula* Huds. North side of Calgary Bay (25). [There is presumably a confirmatory specimen of this N.C.R. in the collection.]

753/11. *C. sylvatica* Huds. Aros (Drumfin) Woods (30). [Recorded from this locality by Ross in 1878 and in *Top. Bot.* as " Ross *cat.*" Add to *C.F.* from which it had been omitted.]

753/13. *C. helodes* Link. North side of Calgary Bay. [Recorded from " Calgary " and other localities by Ross.]

753/17. *C. distans* L. Calgary Bay (25; Temperley); Kellan (27).

753/19. *C. Hostiana* DC. (*C. fulva* auct.). Bogs near Fionphort (26; " and abundance of hybrid ×*C. xanthocarpa* Dégl.," Temperley [which needs confirmation from the collection]); Kellan (27; " and hybrid ×*C. xanthocarpa* Dégl." [again, requiring confirmation from the collection], Templeman).

753/23. *C. extensa* Good. Head of Loch Cuan near Dervaig, in salt marsh (25).

753/38. *C. limosa* L. Loch an t-Suidhe, near Bunessan (26); (Linne nan Ribheid (4)).

753/51. *C. Bigelowii* Torr., (*C. rigida* Good. non Schrank). Creag Brimishgan, below 1000 ft. (29); (Ben More, Coire nam Fuaran and summit ridge (1), and dryish north-east rocks (8)).

753/57. *C. remota* L. Calgary Bay (25); Aros (Drumfin) Woods (30).

753/72. *C. pauciflora* Lightf. (Near Caol Lochan (31); high on south-west shoulder of Ben More (8).)

775/1. *Milium effusum* L. (Aros (Drumfin) Woods (30). [Not in *Top. Bot.* or *Supps.*, Ewing 1899, or *C.F.*, but not N.C.R. as it was recorded from this locality by Ross (1878 : 241).

783/1. *Calamagrostis epigeios* (L.) Roth. Aros (Drumfin) Woods (30), (" one or two good patches seen " (2)). [" Frequent "—Ross (1878 : 241), who mentions this with other localities : but not given for 103, by Ewing, 1899.]

791/2. *Deschampsia alpina* (L.) R. & S. (Ben More, north-east rocks (8).) [Recorded for Mull—without locality—by Ewing (1888 : 321), and in *C.F.*]

794/6. *Avena strigosa* Schreb. Near Aros Castle (E. Vachell). [" Among corn, in all the crofts and farms "—Ross (1878 : 241).]

824/7. *Poa nemoralis* L. Aros (Drumfin) Woods (30). [N.C.R. if confirmed by specimen in collection.]

826/10b. *Festuca vivipara* (L.) Sm. (Noted in many places on Ben More and Gribun Peninsula (1, 8, 9, 11).)

839/2. *Juniperus sibirica* Burgsd. (*J. nana* Willd.). Sea cliffs near Bloody Bay (30); (gorge of Abhuinn Dhiseig, south-west base of Ben More (1); Gribun Peninsula, west of Burg (9); cliffs above Carsaig Arches (11)). [" Frequent "; Ross.]

845/1. *Cryptogramma crispa* (L.) R. Br. (Ben More, Abhuinn Dhiseig, near upper falls, and on screes of Coire nam Fuaran (1), also north-east rocks (8).)

851/1. *Asplenium marinum* L. Loch Buie (28); near sea, north base of Ben More (29); (Gribun Peninsula, sea cliffs west of Burg and in " the Wilderness " (9)).

851/7. *A. Ruta-muraria* L. (Gribun Peninsula, south-west of Balmeanach (9); cliffs above Carsaig Arches (11).)

864/1. *Osmunda regalis* L. Glen Lirein (28); (streamside near Toba Bhreaca (4)). [" Plentiful "; Ross.]

865/1. *Botrychium Lunaria* (L.) Sw. Near Loch Peallach (25).

869/1. *Isoetes lacustris* L., det. A. H. G. Alston, " spores examined." (Peaty tarn above Carsaig Arches (11), specimen in Herb. Mus. Brit.)

The following species mentioned in one or other of the lists contributed, must await confirmation from the collection, as being either more doubtful or given without precise locality :—

88/33. *Viola lutea* Huds. Would be N.C.R., but the "f. *Curtisii* (Forst.) Drabble" may have been intended.
96/2. *Silene Cucubalus* Wibel, (*S. inflata* Sm.). No locality; would be N.C.R.
117/2. *Malva sylvestris* L. No locality; would be N.C.R.
155/15. *Trifolium hybridum* L. No locality; would be N.C.R.
176/4. *Vicia Orobus* DC. No locality. Queried by Ewing, 1899; given for 103 in *C.F.*
191/2. *Agrimonia odorata* (Gouan) Mill. ? near Calgary (25). [Awaits confirmation from collection; would be N.C.R. but Ross (1878) gives *A. Eupatoria* which is not accepted in *Top. Bot.* or *Supp.*, is queried by Ewing (1899) and given in *C.F.*]
194/15. *Rosa rubiginosa* L. No locality; would be N.C.R.
195/1. *Pyrus Malus* L. No locality; would be N.C.R.
217/5. *Callitriche intermedia* G. F. Hoffm. No locality. [Given for 103, by Ewing (1899) and by Bennett in *Top. Bot. Supp.* as "103 !," but omitted from *C.F.* !]
247/1. *Apium graveolens* L. No locality; would be N.C.R.
308/5. *Scabiosa arvensis* L. No locality; would be N.C.R., though Ewing (1899 : 64) has "?" against 103.
371/3. *Matricaria* "*suaveolens* (Pursh) Buch." No locality; would be N.C.R.
393/2. *Arctium vulgare* (Hill) Evans, ("*A. nemorosum*"). No locality; would be N.C.R.
669/11. *Orchis Fuchsii* Druce. No locality; would be N.C.R.
722/3. *Sparganium simplex* Huds. No locality. [Given by Ross (1878), *Top. Bot.*, Ewing, and *C.F.*]
746/12. *Scirpus cernuus* Vahl. Queried for Kellan (27). [Bracketed in *Top. Bot.*, ed. 2: added in *Supp.* ("Somerville sp."); queried by Ewing (1899); given in *C.F.*]
795/2. *Arrhenatherum tuberosum* (Gilib.) Druce. No locality; would be N.C.R.
825(2)/1. *Puccinellia maritima* (L.) Parl. (*Glyceria maritima* (L.) M. & K.) No locality. [Not in *C.F.* though in *Top. Bot. Supp.* as "Macvicar sp." and in Ewing (1899) as "Ewing."]
833(2)/1. *Pholiurus filiformis* (Roth) Sch. & Thell. (*Lepturus filiformis* (Roth) Trin.) Queried for salt marsh near Dervaig (25). [Given in Ewing (1899 : "Ewing") and *C.F.*; in *Top. Bot.*, ed. 2, as "103 Ebudes south. Grieve," which presumably, like other of Grieve's records, refers to v.-c. 102.]

IONA AND LUNGA

Mr Templeman gives the following account of his visit to Iona. "August 3rd to 7th. Four most delightful days and nights were spent on Iona in perfect weather. After lunch on August 4th I crossed by Ferry to Fionphort on the Ross of Mull . . . August 5th. A long day was spent on the Columba Hotel's motor-boat *Islander* from Iona, passing the Dutchman's Cap to Lunga Isle. Here a few interesting plants were observed. . . . . *Mertensia maritima* grows in some plenty among shingle near the middle of Lunga. On the cliffs and cliff-tops were *Sedum Rosea*, *Ligusticum scoticum*, *Asplenium marinum* and *A. Adiantum-nigrum*, *Geranium sanguineum*, *Rosa spinosissima*, *Sedum anglicum*, *Erythraea Centaurium*, *Sagina subulata*, etc., with *Salix repens* and *S. argentea* and many common plants. In the marshes were *Schoenus nigricans*, *Narthecium ossifragum*, etc. From Lunga we sailed by Fladdam, where over a dozen grey seals were seen, to Burg More Island to see the ruins of the fort, with *Sedum Rosea* and other cliff plants. On Staffa were *Ligusticum scoticum*, *Asplenium marinum*, etc.

Among the plants found on Iona, but not observed in Mull, were *Thalictrum minus*, *Cochlearia danica*, *Drosera longifolia* (*intermedia*) (Loch Staoineig), *Peplis Portula*, †*Inula Helenium* (near village), *Scirpus fluitans*, and *Scilla verna*. The last, with *Sedum Rosea*, *Ligusticum scoticum*, *Asplenium marinum*, *Juniperus nana* and *Sedum anglicum*, are among the characteristic plants of Iona, especially the sea-cliff species. Other plants seen on Iona were:—*Nymphaea alba*, *Sagina subulata*, *S. nodosa*, *Radiola Linoides*, *Hypericum elodes*, *Rosa spinosissima*, *Cotyledon Umbilicus*, *Utricularia minor* ?, *Anagallis tenella*, *Centunculus minimus*, *Samolus Valerandi*, *Littorella uniflora*, *Polygonum Hydropiper*, *Empetrum nigrum*, *Orchis ericetorum*, *Schoenus nigricans*, *Scirpus maritimus* and *S. pauciflorus*, and *Osmunda regalis* (on dripping rocks E. of Port Goirtean Iar, at the S. end of the island). *Eryngium maritimum* and a few other recorded species were not found."

September 16. S. Essex, v.-c. 18. An Alien Hunt in the Neighbourhood of London. Leader: Mr J. P. M. Brenan.

This excursion could not be held owing to the outbreak of war and consequent dislocation of transport due to the evacuation of London. It was intended to examine several areas of waste ground close to Dagenham, where refuse from the Ford factory had been deposited. These areas had given promise earlier in the year of being very productive, and a private excursion there made in October amply fulfilled expectation. J. P. M. Brenan.

PLANT NOTES.

[In the case of direct contributions the name of the author of the Note is printed in small capitals. Where the name of the author is not in small capitals, and is coupled with a date (the name and date, or date alone, being bracketed), the Note is an Abstract, its origin being ascertainable by reference to the Bibliography.—Ed.]

†11/2. **Aquilegia pyrenaica** DC., *Fl. Fr.*, ed. 3, v, 640 (1815). The above name must, according to Skalinska (1940), be used for the plant hitherto known from Caenlochan Glen, Angus, as *A. alpina* L. As recently as 1935 this plant was yet growing in the glen, associated with *Primula Auricula* and *Myosotis alpestris*. A table of differences between the two species is included in a full discussion.

35/4. Rorippa islandica (Oeder) Borbás (=*Nasturtium islandicum* (Oeder)). Sprague (1939 B) shows that *Sisymbrium islandicum* Oeder, *Fl. Dan.*, iii, fasc. 7, t. 409 (1768), was validly published.

†80/4c. Raphanus sativus L. var. **dasycarpus** (O. E. Schulz ex Thell. in Hegi) O. E. Schulz in *Das Pflanzenr.*, iv, 105, p. 206 (1919); Asch. & Graebn., *Syn. der Mitteleur. Fl.*, iv, 4, p. 133 (1936). *R. Raphanistrum* L. ssp. *sativus* (L.) Domin var. *dasycarpus* O. E. Schulz ex Thellung in Hegi *Ill. Fl. Mitteleur.*, iv, i, 280 in nota (1918). "*R. Monnetii* Léveillé . . . (1916) . . . probabiliter," sec. O. E. Schulz, *l.c.* (1919).

16, W. Kent; Tonbridge, on waste ground, J. P. M. Brenan.

O. E. Schulz (1919) describes this variety as follows:—"Siliquae pilis conicis brevibus erecto-patentibus ± obsitae, scabrae." The plants found at Tonbridge agree well with this description. At first the siliquas are uniformly covered with the small stiff hyaline conical hairs, each one borne on a small tubercle. The hairs are erect-ascending so that the siliqua feels scabrous when rubbed downwards. Later, as the basal part of the siliqua becomes much swollen, the hairs in this region become spaced out and consequently appear sparser; the beak, however, is still more or less densely covered. One of the Tonbridge plants had the petals white, while another had the claws of the petals white (except for the veins) and the laminae reddish-lilac. No other differences from typical *R. sativus* were noted.

Normally *R. sativus* has the siliquas quite smooth, and the flowers—at any rate of the plants occurring on the rubbish tips—are usually reddish-lilac in colour.

The geographical distribution of the variety is peculiar. Schulz (1919) cites single gatherings from Egypt, N. Persia, E. Indies, Java, and the West Indies (St Thomas), and records it as occurring in the Botanic Gardens at Berlin-Dahlem (cultivated) and Leipzig. It has, perhaps, been passed over as the normal cultivated radish.

Owing to present circumstances, no authentic specimens have been seen. An examination of the material of *R. sativus* in the Kew Herbarium, to the authorities of which I am indebted for their kindness, failed to reveal any sheets under the name var. *dasycarpus.* There are, however, two sheets of a single gathering (" Cult. in Hort. Bot. Reg. Kew, A.D. Aug. 1929 ") labelled *Raphanus sativus* L. var. (fruits very hispid), which agree well with the Tonbridge plants. The Kew gathering was sent in as *R. caudatus* L., which is an entirely different plant, having very elongated beaks to the siliquas. No material from any of the countries cited by Schulz was seen there. It is evidently a variety of rare occurrence. So far no material from any other British locality has been seen.

This variety appears to be analogous to the hispid fruited varieties that occur in other Cruciferae which also have glabrous fruits (e.g. *Rapistrum*, *Sinapis arvensis*, etc.).—J. P. M. Brenan.

There is, however, a similar specimen among the material still available in the British Museum Herbarium at South Kensington, from 21, Middlesex, Natural History Museum garden, 1919, H. F. Wernham.—A. J. Wilmott.

†93/1. **Kohlrauschia prolifera** (L.) Kunth forma **laevis** (Clav.) Sandwith, comb. nov. *Dianthus prolifer* L. var. *laevis* Clav. *Fl. Gironde*, i, 156 (1882); F. N. Williams in *Journ. Linn. Soc. Bot.*, xxix, 465 (1893). *Tunica prolifera* (L.) Scop. var. *laevis* (Clav.) Rouy et Foucaud, *Fl. France*, iii, 159 (1896); Gürke in Richter, *Pl. Europ.*, ii, iii, 338 (1903). *T. prolifera* var. *typica* Fiori et Paoletti f. *laevis* (Clav.) Fiori et Paoletti, *Fl. Analit. Ital.*, i, 374 (1896-8). *T. prolifera* subsp. *eu-prolifera* Briq. var. *genuina* Briq. subvar. *laevis* (Clav.) Briq. *Prodr. Fl. Corse*, i, 569 (1910). *T. prolifera* subsp. *eu-prolifera* f. *laevis* (Clav.) Graebn. in Asch. et Graebn. *Syn. Mitteleurop. Fl.*, v, 2, 264 (1921).

15, East Kent; on a disused railway track at Richborough, July 1939, J. P. M. Brenan and N. Y. Sandwith; presumably an introduction in this locality.

Occurs here and there in Europe with the commoner typical form, which has been named *Dianthus prolifer* var. *scabrifolius* Clav., *D. prolifer* var. *typicus* F. N. Williams, and *Tunica prolifera* subsp. *eu-prolifera* Briq. var. *genuina* Briq. subvar. *scabrifolia* (Clav.) Briq. The var. *laevis* was described by Clavaud as having the leaves smooth on the margins and dorsal nerve, and the floral bracts less conspicuously punctate than in what is generally treated as representing the typical form, var. *scabrifolius* Clav., in which the leaves are scabrous-ciliate on the margins and dorsal nerve. All British specimens of *K. prolifera* in the National and Druce Herbaria, whether native or introduced, have the leaves scabrous-ciliate on the margins with forward-directed setulae, while the dorsal nerve may be either glabrous or setulose. There is an interesting variability in the clothing of the stems. In specimens from certain localities the stems are conspicuously puberulous with more or less downward-directed hairs, while in others they are glabrous or nearly so. Thus the specimens from Hayling Island and Ryde (Isle of Wight), and most of those from Jersey, have conspicuously puberulous stems; while the very numerous ones from Pagham have them glabrous or nearly so. The introduced Richborough plant represents an extreme form with completely glabrous leaves and stems which does not appear to have been recorded previously from Britain, although it may well occur in other British populations of the species. It should be identified with Clavaud's var *laevis*, although the floral bracts are conspicuously punctate. There is probably no correlation between the latter character and the degree of indumentum on the leaves and stems.

Following the practice of several recent or contemporary authors, the present writer prefers to separate the section *Kohlrauschia* generically from *Tunica*, on the grounds both of facies and technical characters.—N. Y. SANDWITH.

†96/2(2)b. **Silene angustifolia** (Ten.) Gussone var. **carneiflora** (Legrand) Pugsl. *S. inflata* var. *carneiflora* Legr. in *Bull. Soc. Bot. Fr.*, xvi, 386 (1869). Recorded by Pugsley (1940 C) from Devon.

103/3. **Sagina intermedia** Fenzl. This name is adopted in place of *S. nivalis* Fr. and *S. caespitosa* of recent British authors, not of (Vahl) Lange, by Polunin (1939 B: 271).—E. C. WALLACE.

Sagina caespitosa Vahl is a very distinct species; the use of the name for the British species was an unfortunate error.—A. J. WILMOTT.

150/1b. CYTISUS SCOPARIUS (L.) Link var. PROSTRATUS (Bailey) Hanb. Seeds collected from the variety in Alderney were sown in the Herbarium Experimental Ground at Kew. The plants retained the flat, spreading habit of their parent or parents and showed no tendency to produce the erect form of the type.—Jackson (1939).

The variety supplied by nurseries is probably not always the same as the wild plant from Cornwall and the Channel Islands.—Woolley (1939).

190/4. **Alchemilla pseudominor** is the name proposed by Wilmott (1939 D) for the plant previously known in Britain as *A. minor*. *A. minor* Huds. is identified with *A. hybrida* (L.) Mill. (=*A. pubescens* Lam.), a plant found in Yorkshire, Westmorland, Scotland and Ireland, and in which sense the former name must be used.

211/22. **Sedum Rosea** (L.) Scop. This was named *Rhodiola Rosea* by Linnaeus, the epithet *Rosea* being the former generic name *Rosea* Riv. which Linnaeus rejected in favour of *Rhodiola*. Hence the correct name under Sedum is *S. Rosea*, not *S. roseum* as hitherto written.—Sprague (1939 A).

353/2. BIDENS TRIPARTITA L. f. RADIANS Beck in Glamorgan. Miss Vachell has sent to the British Museum specimens of *Bidens tripartita* in which the capitula bear about five or six ray florets, the ligules being about (2-)3 mm. long and between one and two mm. broad. This radiate form is not mentioned in most floras, and I am not aware that it has previously been noticed in the British Isles. It is mentioned in Hegi's *Ill. Fl. Mitteleur.*, vi, i, 518 (1918) under the above name, as being " var. *radiatus* DC. nec *B. radiatus* Thuill." Hegi also mentions a f. *mixtus* Kitt., which has ligulate florets on the lower capitula but none on the upper. The specimens were collected by Miss Vachell on the margin of a pond at Taff's Well, Sept. 1934.—A. J. WILMOTT.

422/3. **Leontodon Leysseri** (Wallr.) Beck. This is the correct name in *Leontodon* for the plant hitherto known as *L. nudicaulis* (L.) Banks (Druce, *B.P.L.*) and *Thrincia hirta* Roth, see Wilmott (1939 A), but the combination dates from Beck (1893: *Fl. Nieder. Österr.*, p. 1312).

506/10. MYOSOTIS VERSICOLOR (Pers.) Sm. var. BREVICALYX Druce, in *B.E.C. 1930 Rep.*, 276 (1931). I have examined the specimens in Herb. Druce and find that of the five gatherings cited with the description, those from Wicklow Sandhills; Watlington, Oxon; and Bembridge, Isle of Wight, are *Myosotis collina*, whilst the specimens from Teesdale, Durham, are typical *M. versicolor*; and those from Abbey Wood, Kent, possess campanulate calyces and somewhat short inflorescences and are evidently *M. versicolor* var. **fallacina** (Jord.) Crép. The description was clearly drawn up from all of this material and as it included discordant elements the var. *brevicalyx* Druce must be rejected.—A. E. WADE.

539/1×1(2). **Limosella aquatica** L. × **subulata** Ives. Plants intermediate between *L. aquatica* and *L. subulata* have been determined as above after experimentation by Blackburn (1939). See Vachell (1939) for historical account.

545/12(1). **Euphrasia Campbellae** Pugsl. Described as a new species by Pugsley (1940 A) from material collected in the Outer Hebrides at Mealista, Uig, Lewis, by Miss M. S. Campbell. It is allied to *E. rotundifolia* and *E. Marshallii* and its chief distinguishing feature is the presence of thick whitish hairs on the underside of the leaves, along the nerves and around the margins.

548. RHINANTHUS L. Wilmott (1940) describes, with the necessary Latin diagnoses, the new species and varieties of *Rhinanthus* which resulted from his revision of the British material in the herbarium of the British Museum, while preparing his delayed paper (published in this Report), which includes many suggestions on problems awaiting solution. See below.

548/5(2). **Rhinanthus calcareus** Wilmott, which has been included hitherto in *R. stenophyllus* (Schur.) Druce.

548/6. RHINANTHUS MONTICOLA. The British plant passing under this name is not the plant which Lamotte intended by *R. minor* var.

monticola and is therefore redescribed as **R. spadiceus** Wilmott. An Orkney form is named subsp. **orcadensis** Wilmott.

548/7. RHINANTHUS BOREALIS (Stern.) E. S. Marshall. A plant from Ben Nevis is named var. **calvescens** Wilmott.

548/8. RHINANTHUS DRUMMOND-HAYI. Material given this invalid name is not uniform, and two new species are described from Scotland, **R. Lintoni** Wilmott and **R. lochabrensis** Wilmott. See paper in this Report for full account of the British species of *Rhinanthus*.

549/3. MELAMPYRUM PRATENSE L. In the account (Britton (1939)) of determinations by Beauverd of recent gatherings of British material the following names are new to the *British Plant List*:—

Subvar. nov. **elongatum** Beauv. (of var. ALPESTRE Beauv.).
Subvar. nov. **decipiens** Beauv. (of var. ERICETORUM D. Oliv.).
Var. nov. **anglicum** Beauv. with two subvarieties, **pseudo-lanceolatum** Beauv. and **pseudo-laciniatum** Beauv.
Subvar. nov. **devonianum** Beauv. (of var. VULGATUM (Pers.) Beauv.).
Subvar. nov. **pallescens** Beauv. (of var. HIANS Druce).

549/4j. MELAMPYRUM PRATENSE L. var. HIANS Druce in Sussex? In the *Flora of Sussex* the editor stated that this " seems to be as frequent as the type in many districts " and localities are cited. Confirmation of the occurrence of var. *hians* in Sussex is desirable, and fresh examples would be welcome. Four to six complete plants are necessary, and notes on the colour of the flowers would be helpful. The var. has been recognised by Beauverd, who so determined plants gathered near Rowfant by Mr A. Beadell. These plants were received by me in a fresh condition. The pale-flowered corolla did not suggest the variety.—C. E. BRITTON.

550. OROBANCHE. Pugsley (1940 D) gives some notes on the British species. The arrangement followed is that adopted by Dr Günther Beck-Mannagetta in his second Monograph (*Pflanzenreich*, iv, 261 (1930)). The British List as amended stands as follows:—

O. ramosa L.
O. purpurea Jacq.
O. alba Steph.
  f. *rubra* (Sm.) Beck (*O. rubra* Sm.).
O. reticulata Wallr. var. *procera* (Koch) Beck.
O. Picridis Hol.
O. maritima Pugsl. sp. nov. = (*O. amethystea* auct. angl. non. Thuillier).
O. minor Sm. (*O. major* L.?).
  f. *procerior* (Rchb.) Beck.

var. *flava* E. Regel (*O. major* f. *hypochaeridis* Beck. *O. minor* var. *concolor* (Duby) Beck pro parte).
var. **compositarum** Pugsl.
O. Hederae Duby.
f. *monochroa* Beck.
f. *stenantha* (Loj.) Beck.
f. *megaphyllon* Beck.
O. caryophyllacea Sm.
O. elatior Sutton.
f. *citrina* (Dr.) Pugsl.
O. Rapum-genistae Thuill.

The records for *O. reticulata* var. *pallidiflora* W. & G. and *O. Rapum-genistae* var. *bracteosa* Reut. for Breconshire are shown to be errors. The former was clearly named *O. reticulata* var. *procera* by Beck.

558. MENTHA. Still (1939) describes the occurrence of a sport among cultivated specimens of *M. crispa* L. with the characters of *M. lacerata* Opiz. (=*M. spicata* Huds. var. *lacerata* (Opiz.) Fraser). He suggests that in view of these " sports," *M. crispa* L. is a hybrid between *M. aquatica* and *M. spicata*; a view held by Fraser.

578/1. GALEOPSIS SPECIOSA Mill., forma. 56, Notts.; cornfield, Everton Carr, Aug. 1939, C. I. and N. Y. SANDWITH. No. 940. Growing with the typical form were a number of plants with the corolla wholly white and yellow, lacking the characteristic violet carpet on the middle lobe of the lower lip, and without a trace of violet dots or lines. The tube was yellowish, the rest of the corolla whitish-cream except for rich yellow areas at the base of the middle lobe of the lower lip and adjacent edges of the lateral lobes. The corolla thus resembled that of *G. dubia*, which occurred in 1918-19 in this neighbourhood. The plants otherwise appeared to agree in all respects with *G. speciosa* and there was no evidence of hybridity with *G. Tetrahit* or other species. *G. speciosa* varies considerably on the Continent, but the above form—perhaps due to a single gene character—does not fit either subsp. *sulfurea* (Jord.) Briq. or subsp. *pallens* (Fries) Briq. It may be similar to the " Formen mit gelber, ungefleckter Unterlippe " which are recorded from the neighbourhood of Innsbruck and Vorarlberg by Gams in Hegi, *Ill. Fl. Mitteleuropa*, v, 4, p. 2468 (1927); or to the unicoloured forms mentioned by Koch and Fiek and cited by Otto Porsch in his paper on " Die Österreichischen Galeopsisarten der Untergattung Tetrahit Reichb." See *Abh. der K.K. Zool.-Bot. Ges. Wien*, ii, 2, 46 (1903). Porsch laments that accurate detailed description of the flower colour of such forms has not been given, the distribution of yellow in relation to white being of importance. No British material agreeing with it has been found in the National or Druce Herbaria. It is hoped that the form will be tested in cultivation, and studied in the light of the elaborate investigations of this genus by Porsch and Müntzing. Seeds have been sent to the last-named botanist.—N. Y. SANDWITH.

618/2(2). **Rumex aquaticus** L. as a British plant is dealt with by Lousley (1939 A). It is shown that *R. aquaticus* L. is distinct from *R. domesticus* Hartm. and *R. Hydrolapathum* Huds.

R. aquaticus L. is a tall (up to 200 cm.) stout perennial, lower leaves (c. 35 × 20 cm.) cordate-ovate or triangular, broadest near the base. Peduncles of fruit with a scarcely thickened, almost imperceptible articulation near the base. Fruiting valves (5-8.5 × 4.5-7 mm.) ovate-triangular, truncate at the base, the apex usually rather drawn out, membranous, entire, always without tubercles. Nut (3.2-3.7 mm. long), brown, broadly trigonous. Distinguished from *R. Hydrolapathum* by the absence of tubercles on the fruits and by the leaves being usually conspicuously broader at the base and thus of a triangular outline. From *R. domesticus* it is easily known by the leaf shape, less congested panicle, and the less evident articulation of the peduncle, which in *R. domesticus* is thickened into a prominent ring. Since he wrote his paper Mr Lousley has seen the plant *in situ* (1939) in more than one place (through the kindness of Mr R. Mackechnie) and feels confident that it is not an introduction.

633/4. ULMUS PLOTII Druce. Melville (1940) discusses its history and shows that Druce was wrong in his identification of Plot's tree, but had recognised as a species one of our most distinctive native elms. Druce was confused in his conception of *U. Plotii*, both by reference to Dr Robert Plot's elm and by the inclusion of a variety of forms under the name in his herbarium. One must regard the tree as being named in honour of Plot, but since it is not Plot's elm, it should be called Plot Elm. Records from 19 Vice-Counties are given.

633/4(2). **Ulmus diversifolia** Melville in *Journ. Bot.*, 77, 138-145. "The East Anglian Elm." This elm has in the past been given various names, all invalid, so it has been renamed and described. It is an upright tree up to about 20 m. in height with spreading branches and rather slender wiry branchlets. First year branchlets of the short shoots are hairy at first, becoming glabrous in the autumn. The short shoots are of three kinds, the majority having distal and subdistal leaves with asymmetrical bases, about 10 per cent. having all the leaves with bases equal or nearly so and a few with both types of leaf together. Asymmetrical distal and subdistal leaves elliptical to obovate-acute, base tapering on the short side, usually semi-cordate on the long side. Symmetrical distal and subdistal leaves elliptical-acute, base cuneate to blunt and symmetrical or nearly so. Subdistal leaves are slightly shorter than distal and both are slightly scabrid above, and shortly softly pubescent below. Leaves of proleptic shoots varying in shape from that of the distal leaves of the short shoots to suborbicular with cordate base. Sucker shoots hairy, leaves elliptic-acute, base cordate or subcordate, roughly scabrid above. Fruit 14-20 mm. long and 8-13 mm. broad, elliptic to obovate, apex rounded, base broadly cuneate, centre of seed about 1/3 of the fruit length from its apex.

A very full and detailed description is given of this distinctive elm, with notes on its known distribution.—N. Essex, Hertford, Suffolk, and Norfolk.

633/5. ULMUS SATIVA Mill. Melville (1939 B) proposes that this name be rejected as a *nomen ambiguum.*

633/6. ULMUS MINOR Mill. Melville (1939 B) proposes that this name be rejected as a *nomen ambiguum.*

641/1. MYRICA GALE L. Two variants having as their most distinctive characteristic, light yellow-green leaves instead of the usual grey-green type, are recorded. One, from Inchnacardoch Forest, Scotland, had slightly smaller leaves than the grey-green type growing in the same district; the other from the shore of Muckross Lake, Killarney, had narrowly oblanceolate leaves congested towards the ends of the branchlets, and suberect, contrasting with the accompanying grey-green type in which the leaves were broadly-oblanceolate, scattered, and spreading at an angle of 45°. Neither variant can, however, be separated from specimens from other parts of Britain on leaf-measurement alone.—Burtt (1939).

650. SALIX L. The following extract—from " Chassagne (Dr M.) & Görz (R.), *Salix* nouveaux de France, (Bull. Soc. Dendrologique, No. 81 (no date on the separate) shortly after 1930)''—was sent to P. M. Hall by M. P. Senay as being of interest to British salicologists:—

" ×**S. Chouardi** Nobis × (*S. atrocinerea* × *viminalis*, n. hybr.).
Differt a *cinerea* × *viminali* foliis subtus multo parcius-pilosis, cano-viridibus v. rarius (imprimis junioribus) pilis rubiginosis ± dense tectis, ramulis tenuioribus anniculis omnino glabratis.
Aveyron: Bords de l'Aveyron entre Gagnac et Aybillac, 600 m. (leg. Soulié sub. nom. *S. cinerea* × *purpurea*).
Cantal: Bords de la Cère, vers Yolet (Dr Chassagne).
Loire-Inférieure: Environs de Nantes (leg. Maupon. Exsic. Société Rochelaise, n° 2.714, sub. nom. *S. Smithiana* Willd. var. *β obscura* G. G.; *S. cinerea* × *viminalis* Wimm.).
Puy-de-Dôme: Bulhon près Lezoux (Dr Chassagne).
Angleterre: Entre Thirsk et Kilwington, North Yorkshire (leg. J. G. Baker, sub. nom. *S. ferruginea* Anders.—Fl. Exsic. Billot, n° 3.678).
F. *sericea*, n.f.
Foliis subtus subsericeis, junioribus rubiginosis.
Bords de la Loire (leg. Boreau, sub. nom. *S. rugosa* Smith).
La prèsence d'un indument plus épais à la face inférieure des feuilles fait supposer que *S. cinerea* serait aussi un des parents de cette forme, mais cet indument peut aussi être dû à *S. viminalis* lorsque celui-ci est dominant. La rareté de *S. cinerea* dans l'Ouest, ou il est remplacé par *S. atrocinerea* permet plutôt d'admettre ici une combinaison *superviminalis.*''

650/3d. SALIX ALBA L. var. **elyensis** Burtt Davy. This new variety was described by Burtt Davy (1938) while engaged on field studies of the cricket-bat willow. He describes it as a tree up to about 50 feet in height with slightly drooping branchlets. Allied to *S. alba* L. var. *caerulea* Smith, differing in the relatively longer catkins; the longer, relatively narrower, acute, rather persistent bracteoles which exceed the stamens and ovary at the flowering stage; and the shortly stipitate ovary with a distinct style. The coppice shoots of the year are greenish in winter and early spring, instead of mahogany-coloured as in *S. alba* var. *caerulea*, and the circumstomatal dots are slightly less densely distributed on the surfaces of the mature leaves. All of these characters suggest some affinity with *S. fragilis*, but the tree is more closely allied to *S. alba*. Recorded from West Norfolk and North Hampshire.

669/11c. ORCHIS MACULATA L. var. **cornubiensis** Pugsl. The plant described by Pugsley (1940 F) under the above name is the Cornish form of *O. Fuchsii* Druce. Of the two spotted orchids *O. ericetorum* is the common Cornish species, *O. Fuchsii* being quite rare. This Cornish plant differs from the usual English *O. Fuchsii* in being relatively dwarf and compact, leaves with dark purple spots recalling *O. mascula*. The spike is short, flowers larger, less lilac in colour with a stout spur as in *praetermissa*. It is described under *O. maculata* L. in the sense of *O. Fuchsii* Dr., as the strict application of the Linnean name has yet to be satisfactorily fixed.

669/11(2). **Orchis hebridensis** Wilmott. A spotted orchid occurring in quantity on Barra and also in Lewis, closely allied to *O. maculata* L. (*O. Fuchsii* Druce) but distinct from both, has been described under the above name pending further investigation, Wilmott (1939 B: 192). It is distinguished from *O. maculata* by being generally shorter, stouter, leaves heavily blotched and sometimes spotted on the underside near the base. The young inflorescence is pyramidal as in *O. ericetorum*, but later it may elongate and look more like *O. purpurella*, although less dense; it is denser than that of *O. maculata*. The labellum is as broad as in *O. ericetorum* and often similar in form, but of the deep colour found in *O. purpurella*.

A hybrid with *O. purpurella* is described and named ×**O. hebridella** Wilmott.

684/9. NARCISSUS ODORUS L. Pugsley (1939 B) shows that the Cornish plant from near St Austell is incorrectly named; the correct name being **N. infundibulum** Poiret.

707/1. ORNITHOGALUM PYRENAICUM L. "Wild Asparagus" (*Journ. Bot.*, 77, 220). The following note from our member, P. Senay, was found among Mr P. M. Hall's papers and may be of general interest:—"Under the name 'wild asparagus' = asperge sauvage, or oftener 'asperge des bois,' the inflorescence of *Ornithogalum pyrenaicum* (before flowers open) is eaten by French peasants in some parts of the country. My own experience bears on Lorraine, where it grows profusely and takes the place of *Scilla non-scripta* in woods—the latter's area reaches to about Bar-le-Duc (Meuse). I very often ate it, cooked either alone with cream, or as a vegetable with meat, or in omelet. I agree that it tastes very much like the garden asparagus. Have you ever tried the tender top part (whitish leaves and young inflorescence) of *Chenopodium album*? I find it more delicate than spinach. I was told that the Germans often gave it as a food to French prisoners during the Great War."

718/9. JUNCUS ACUTIFLORUS Ehrh., a form with the heads densely congested in a small capitate inflorescence. 9, Dorset; in some quantity on the sandy edge of a bog on Scotland Heath, Purbeck, Aug. 1940. N. Y. SANDWITH and N. D. SIMPSON. This agrees with Lange's material from La Teste de Buch, W. France, which he referred (as " forma similis ") to his own *J. silvaticus* Reich. and forma γ *congestus* Lge., published in *Kjoeb. Vidensk. Meddel.* for 1860, p. 67 (1861). This form, discovered at Santiago de Compostela in N.W. Spain, was characterised by " ramis ramulisque cymae abbreviatis, glomerulis multi- (12-16) floris, dense confertis." The French and Dorset plants differ in their fewer-flowered clusters. In the same year but probably later (the preface by Willkomm is dated Oct. 12th, 1861), in his account of *Juncaceae* in Willk. et Lge. *Prodr. Fl. Hisp.*, i, 185 (1861), Lange again published the same form from the same locality as *J. silvaticus* forma γ *confertus* Lge., " glomeruli multiflori, ramis brevissimis dense congesti." The latter name has been taken up or cited by subsequent authors such as Buchenau, in Engler, *Pflanzenreich*, iv, 36 (*Juncaceae*), p. 210 (1906), as *J. silvaticus* Reich. var. *confertus* Lge.; Hegi, *Fl. Mitteleurop.*, ii, 170 (1909), as *J. acutiflorus* Ehrh. var. *confertus* (Lge.) Hegi; Rouy, *Fl. France*, xiii, 242 (1912), as *J. silvaticus* Reich. var. β *confertus* Lge.; and Coutinho, *Fl. Portugal*, 118 (1913), as *J. acutiflorus* Ehrh. var. β *confertus* Lge. Both Buchenau and Rouy inaccurately give the reference from the Videnskabelige Meddelelser, where the name given was *congestus*; and they all assign varietal rank, whereas Lange in both descriptions clearly designated the plant as " forma," which is doubtless the rank it deserves. It should therefore be known as *Juncus acutiflorus* Ehrh. forma **congestus** (Lge.) *mihi*, comb. nov. No form approaching Lange's plant appears to have been recorded hitherto from this country.—N. Y. SANDWITH.

737/2. ×POTAMOGETON MACVICARII A. Benn. Dandy & Taylor (1939) show that it is the same as ×*P. Griffithii* A. Benn (=*P. alpinus* × *praelongus*).

737/3. **Potamogeton nodosus** Poir. According to Dandy & Taylor (1939) this is the correct name of the plant hitherto known in Britain as *P. Drucei* Fryer. Vice-county distribution is given as 6, 9. 22, 34. Delete 8 in *C.F.* (error for 6).

737/6. ×POTAMOGETON GRIFFITHII Ar. Benn. This is shown by Dandy & Taylor (1939) to be a hybrid between *P. alpinus* and *P. praelongus*.

737/12. POTAMOGETON BABINGTONII A. Benn. (=×*P. Zizii* Koch ex Roth). Dandy and Taylor (1939) discuss the identity of *P. Babingtonii* Ar. Benn. and show that it is referable to ×*P. Zizii* Koch ex Roth (=*P. gramineus* × *lucens*). The name *P. angustifolius* Bercht. & Presl, often used for it, probably refers to a form of *P. gramineus*.

737/13. ×POTAMOGETON FLUITANS Roth. Recorded from South Hants.; Moors R. by footbridge at Palmer's Ford, St Leonards and St Ives, P. M. HALL, 1939.—Dandy & Taylor (1939, 255) and from a tributory of the River Stour near Hurst Station, F. TOWNSEND, 1879.—Dandy & Taylor (1939, 342).

737/14. ×POTAMOGETON DECIPIENS Nolte. Recorded from Kennet and Avon Canal, Steep Green, Burbage, South Wilts., G. Taylor.—Dandy & Taylor (1939).

737/14c. POTAMOGETON SALIGNUS Fryer ap. Hiern (=×*P. decipiens* var. *salicifolius* Ar. Benn., the *Brit. Pl. List*, ed. 2). Dandy & Taylor (1939) discuss the identity of *P. salignus*. This was first published by Hiern in the *Victoria County History* (1906), p. 129. The account embraced two elements: (1) a plant from N. Devon which is ×*P. nitens* Weber, and which does not agree with the diagnosis of *P. salignus*; (2) a plant from the Hereford Wye, which is × *P. decipiens* Nolte & Koch (=*P .lucens* × *perfoliatus*). This latter agrees with the diagnosis. Fryer believed that the Wye plant was allied to ×*P. decipiens* but sufficiently worthy of segregation, a view which is not held by Dandy & Taylor.

737/17. ×POTAMOGETON BENNETTII Fryer. This is a hybrid between *P. crispus* and *P. trichoides*.—Dandy & Taylor (1939).

751/1. **Kobresia simpliciuscula** (Wahlenb.) Mackenzie. This name is adopted by Polunin (1939 B: 272) in place of *K. caricina* Willd. and *K. bipartita* auct. non (All.) Dalla Torre.

753/22. CAREX OEDERI Retz. Nelmes (1939) shows that this name is a synonym of *C. pilulifera* L. and therefore cannot be used in the current sense of Kükenthal and others. *C. serotina* Mérat is tentatively suggested as the name which will replace *C. Oederi*, unless the American *C. viridula* Michaux proves to be identical.

[Dr Polunin and I have compared the American *C. viridula* with British "*C. Oederi*" and find them to be identical.—A. J. WILMOTT.]

753/33. CAREX DIVERSICOLOR Crantz. **C. flacca** Schreb. is the correct name for the species concerned. Druce wrongly assumed *C. diversi-*

color Crantz to be identical with *C. flacca* Schreb. The former is synonymous with *C. acuta*, for which it is a superfluous name and therefore illegitimate.—Nelmes and Sprague (1939: 179).

753/49(2). **Carex eboracensis** Nelmes. A puzzling sedge collected by the Rev. James Dalton at Copgrove, Knaresborough, Yorkshire, in 1802. C. B. Clarke confessed on one of the Kew specimens of Dalton's gathering that he was "afraid to guess the species," and the better specimen (type) at the British Museum was found in the *C. flacca* Schreb. cover.

The plant is really a near relative of that very polymorphic species, *C. Goodenowii* Gay, and stands even closer to *C. juncella* (Fries) Fries. *C. juncella*, which Kükenthal considers to be a variety of *C. Goodenowii*, differs from this species chiefly in its tufted habit and aphyllopodic (surrounded at the base by bladeless leaves) flowering stems. *C. eboracensis* is similarly, and by other, less important, characters, also distinct from *C. Goodenowii*. Its distinctness from *C. juncella* rests on smaller but numerous differences of considerable total value. Those differentiating characters of *C. eboracensis* are mentioned by Nelmes (1939: 112) just above the Latin description, a translation of which is given here:—*Rootstock* caespitose. *Stems* 20-30 cm. tall, erect, slender, smooth below but scabridulous above, surrounded at the base by a few chestnut-coloured leafless sheaths. *Leaves* shorter than the stems, 1.5-2 mm. broad, flattish but often with revolute margins, fairly smooth and rather stiff. *Spikes* 3-4, usually 4, rather distantly spaced from one another, upper 1-2 (rarely 3) male, lanceolate-cylindrical, dense-flowered, 2-3 cm. long; remainder (2-3) wholly female or uppermost sometimes androgynaeceous, 1.5-3.5 cm. long, upper 1-2 sessile or subsessile, lower 1-2 peduncled (peduncles up to 2.3 cm. long), erect or patulous, slender, cylindrical, somewhat dense-flowered but lower laxer at the base. *Bracts* (lower) foliaceous, falling short of the apex of the inflorescence, upper very short and squamiform at the base. *Scales* not hyaline on the margins, midrib pale, keeled, and not reaching the apex of the scale; male very obtuse, obovate, yellow-brown; female oblong-elliptical, obtuse, golden-brown. *Utricles* about equalling or slightly longer and broader than the scales, elliptical, suberect, densely puncticulate, 2.5-3 mm. long, about 1.5 mm. broad, very finely 1-4-nerved on the dorsal face and obsoletely nerved on the ventral face, pale green, obconic-stipitate at the base, abruptly contracted at the apex into a short beak which is entire or bidentulate at the mouth. *Nut* not filling the utricle, obovate-elliptical, long-beaked. *Stigmas* 2. E. Nelmes.

753/51. **Carex Bigelowii** Torr. ex Schwein. This name is adopted by Polunin (1939 B: 272) in place of *C. rigida* Good. non Schrank and *C. concolor* auct. non R. Br.

753/54. **Carex bipartita** All. This name is adopted, in place of *C. Lachenalii* Schkuhr and *C. lagopina* Wahlenb., by Mackenzie in his account of the N. American Carices (*N. Amer. Fl.*, xviii, 88: 1931), having been earlier investigated by Holm in *Amer. Journ. Sci.*, iv, xv, 145-152: 1903, and Mackenzie (*Bull. Torr. Club*, i, 348: 1923); it is also taken up by Polunin (1939 B: 272).

753/59. CAREX VULPINA L. in England. The plant which has been known to western (and southern) European botanists as *Carex vulpina* L. ever since the time of Linnaeus is a different species from that known under the same name for a similar period in eastern (and northern) Europe. According to Nelmes (1939: 259) the eastern species is the true *Carex vulpina* L. for various reasons, chief of which appear to be the following:—(1) It is the plant of the Linnaean Herbarium, (2) although Linnaeus appears to include both species in his conception of *C. vulpina*, there is evidence that he was more familiar with the eastern (which is also a Swedish) plant, and (3) the "spike" of the eastern species is strikingly similar in colour to the fox's coat. Reason (4) is explained in the concluding paragraph in *Journ. Bot.*:—"The deciding argument, however, for applying the name *C. vulpina* L. to the eastern plant appears to be Art. 52 of the International Rules of Botanical Nomenclature, ed. 3, 1935."

The Rules do not allow the name *C. nemorosa* Rebent. (1804) to be applied to our common western species, because Schrank in 1789 used this epithet for another *Carex* (*C. alba* Scop.). An examination of the claims of other epithets which have been applied to our western plant show that **Otrubae** appears to be the correct one. It was given by Podpera, a Czech botanist, in 1922, to a supposed hybrid between the western plant and *C. spicata* Huds., which has since been identified by Nelmes and others as a form of the western plant itself.

While *C. Otrubae* Podp. extends eastwards right across Europe, *C. vulpina* L. was not known with certainty to occur in this country until 1939, when it was realised that plants collected during the previous summer by Mr E. C. Wallace in W. Sussex were of this species. It is true that Samuelsson says that H. E. Garnsey collected it near Oxford in 1881, and that this gathering is at Vienna, but the significance of the discovery was apparently lost on British botanists because of the long-standing misinterpretation of *C. vulpina*.

Following the identification of Wallace's discovery a search was made in the "*Carex vulpina*" covers in some of the more important herbaria. Specimens of the true *C. vulpina* L. were noted in Herb. Mus. Brit., collected at Amberley Wild Brooks (which is also in W. Sussex) in 1912 by C. C. Lacaita, and one in Herb. Marshall, from the Eden, below Chiddingstone, W. Kent, where it was collected in 1894 by E. S. Marshall himself, and named by Kükenthal *C. paniculata* × *C. vulpina*. The plant was seen growing at these localities in the 1939 season, and it was found in E. Sussex in 1940. (In the summer of 1941 the known range of *C. vulpina* in Britain was considerably extended by the discovery of the plant at Coombe Hill Canal, west of Cheltenham (33, E. Glos.).)

It may be useful to give here, side by side, the chief contrasting characters of the two species:—

C. vulpina L.	*C. Otrubae* Podp.
Stem robust, 3-winged, faces somewhat concave.	Stem less robust, 3-angled, faces flattish.
Leaves dark bright green, even when dry, usually broad, ligule more or less truncate.	Leaves grey-green when dry, broad but usually narrower than in the eastern plant, ligule more or less triangular with a rounded apex, sometimes elongate.
Inflorescence bright warm brown, usually dense but sometimes lax below, subpyramidal, rarely oblong, usually appearing ebracteate, with conspicuous dark brown auricles at the base.	Inflorescence yellowish-green or light brown, sometimes dense but often lax-flowered and sometimes considerably interrupted below, oblong, rarely subpyramidal, usually conspicuously bracteate, auricles pale and inconspicuous.
Utricles brownish, ovate, suberect to patulous, few-nerved on the dorsal face, and usually nerveless on the ventral face, with a deep broad groove on the back of the beak; seen to be densely papillose under a pocket lens (× 10).	Utricles greenish, ovate-lanceolate, becoming strongly divaricate, usually distinctly several-nerved on both faces, no deep broad groove on the back of the beak; smooth under a lens.

E. Nelmes.

753/75. Carex dioica L. This name as used by Linnaeus covered two species, subsequently described as *C. laevis* Hoppe (*C. Linnaeana* Host.) and *C. Davalliana* Sm. (*C. scabra* Hoppe). The name *dioica* has been generally applied to the Swedish (and British) species, *C. laevis* Hoppe, and should be retained for it.—Nelmes and Sprague (1939: 152).

753/75b. Carex dioica L. Plants collected on the lower slopes of Ben Douran, Argyll, seem to be referable to f. **isogyna** (Fr.) Kük. (*Journ. Bot.*, *65*, 351, *67*, 82.). They were very conspicuous at a distance over a small area. Specimens will be distributed at a later date.—E. C. Wallace.

826/1c. **Scleropoa rigida** (L.) Griseb. var. **major** (J. B. Presl) Lousley (1939 C: 202). *Sclerochloa patens* J. B. Presl; *S. rigida* (L.) Beauv. var. *major* J. B. Presl; *Festuca rigida* (L.) Kunth subvar. *patens* Cosson & Dur.; *F. rigida* (L.) Kunth subvar. *umbrosa* Cosson & Germ.; *Scleropoa rigida* (L.) Griseb. var. *patens* Willk; *Festuca rigida* (L.) Kunth var. *patens* Lousley in *Watson B.E.C. 1933 Rep.*, 240 (1934).

PLANT RECORDS.

*=New vice-county record. †=Not native in this locality.

Note.—In the case of direct contributions, the name of the contributor is printed in small capitals. In the case of records which are Abstracts, the author's name and date, or the date alone, are enclosed in brackets. When no date is mentioned, the record is for 1939, except for the Staffordshire records of G. J. V. Bemrose and E. S. Edees, extracted from *N. Staffs. F.C.*, Trans., lxxv, 16-, where no definite year was mentioned.

*1/1. Clematis Vitalba L. 48, Merioneth; near Llwyngwern Station, 1940; between Penybont and Fridd Gate, Harlech, 1940, J. A Webb, comm. Dept. Bot., Nat. Mus. Wales.

2/5. Thalictrum alpinum L. H.27, West Mayo; Mweelrea, at 2000 ft., W. A. Sledge.

3/2c. Anemone nemorosa L. var. caerulea DC. 45, Pembroke; open glades, Slebech, J. G. Williams, comm. Dept. Bot., Nat. Mus Wales.

5/1. Myosurus minimus L. 21, Middlesex; field between Hampton and Sunbury, 1896, White, comm. A. E. Ellis.

*6/4. Ranunculus auricomus L. 94, Banff; Colleonard, near Banff, Miss M. McC. Webster.

*6/22(2). Ranunculus radians Revel. 7, N. Wiltshire; near Frith Copse, Lydiard, and between Flaxlands and Hook, J. D. Grose (*Wilts. Arch. and N.H. Mag.*, xliii, 408).

6/24. Ranunculus heterophyllus Weber. 3, S. Devon; Woodbury, S. Edwards and B. Godfrey, comm. G. T. Fraser.

6/26. Ranunculus pseudo-fluitans (Syme) Newbould ex Baker et Foggitt. 3, S. Devon; river Otter, Ottery St Mary, Rev. W. K. Martin and G. T. Fraser; river Teign, Branscombe, G. T. Fraser.

6/28. Ranunculus Baudotii Godr. 3, S. Devon; West Down, Littleham, B. Godfrey, comm. G. F. Fraser.

6/33b. Ranunculus Ficaria L. var. divergens F. Schultz. 39, Staffs.; Burston, G. J. V. Bemrose.

6/33e. Ranunculus Ficaria L. var. bulbifera Marsden-Jones. 20, Herts.; Rickmansworth, F. M. Day. 49, Caernarvon; Pwllheli, 1940, J. Rees.

*7/2. Caltha radicans T. F. Forst. 103, Mid Ebudes; Coire nam Fuaran, Ben More, Mull, A. Templeman, comm. A. J. Wilmott.

9/1b. Helleborus viridis L. var. occidentalis (Reut.) Druce. 3, S. Devon; near Burrator Lake, Walkhampton, E. M. Phillips and F. C. Marks, comm. G. T. Fraser. *43, Radnor; near Llandeilo-graban, 1937, J. G. Williams, comm. Dept. Bot., Nat. Mus. Wales. 65, N.W. Yorks.; Kirby Fleetham, near Northallerton, 1906, H. K. Wallace, comm. A. E. Ellis.

9/2. Helleborus foetidus L. 22, Berks.; bushy chalkpit in wood, Yattendon, N. E. G. Cruttwell. 47, Montgomery; near Berriew, Miss S. Haines. 62, N.E. Yorks.; calcareous hill, Old Stead, G. Foggitt. [Dr W. A. Sledge tells me that this plant is wild in v.-cc. 62, 63, and 64, and therefore brackets should be removed in *C.F.*—Ed.]

†10/1. Eranthis hyemalis (L.) Salisb. 26, W. Suffolk; for W. Sussex of the record in *B.E.C. 1938 Rep.*, 33 (1939), read W. Suffolk.

14/1. Aconitum anglicum Stapf. 7, N. Wilts.; banks of By Brook, Ford, 1920, A. E. Ellis. [Add to *C.F.* but has been recorded previously by Grose (*Wilts. Arch. & N.H. Mag.*, xlix, 332, 1941). Not in *Top. Bot.* or *Supps.*—Ed.]

21/2c. Papaver Rhoeas L. var. Pryorii Druce. 17, Surrey; Pyrford: Epsom College, cultivated fields, 1938, A. E. Ellis.

22/1. Meconopsis cambrica (L.) Vig. 4, N. Devon; Marystow, F. C. Marks and E. M. Phillips. 64, Mid West Yorks.; Craven, August 1820, A. W. Franks, comm. A. E. Ellis. [Apparently earliest notice in Yorkshire.—Ed.]

†27/1. Argemone mexicana L. 18, S. Essex; waste ground, Dagenham, J. P. M. Brenan and N. Y. Sandwith.

†30/1. Dicentra formosa Walp. 16, W. Kent; near High Rocks. first noted 1937, now in slightly greater quantity, J. R. Wallis.

*†31/2. Corydalis cava (L.) Schweigg. et Körte. 34, W. Gloucester; Stinchcombe, Charles Thomas (1941: *Proc. Cotteswold Nat. F.C.*, 1940, xxvii, 111).

32/5d. Fumaria Boraei Jord. var. britannica Pugsl. 15, E. Kent: cornfield near Snargate, E. C. Wallace.

32/12. Fumaria Vaillantii Lois. 17, Surrey; Epsom College grounds, A. E. Ellis.

32/13. Fumaria parviflora Lam. 17, Surrey; cabbage field, Clandon Downs, 1938, G. Watts and A. L. Still.

†32/14. FUMARIA AGRARIA Lag. 18, S. Essex; waste ground, Dagenham, J. P. M. BRENAN and N. Y. SANDWITH. Confirmed by H. W. Pugsley.

*35/2. RORIPPA SYLVESTRIS (L.) Smith. 100, Clyde Isles; Ardencraig, Bute, 1928, A. E. ELLIS.

†35/5. RORIPPA AUSTRIACA (Crantz) Bess. 41, Glam.; near King's Dock, Danygraig, Swansea, J. A. WEBB, comm. DEPT. BOT., NAT. MUS. Wales.

36/2. BARBAREA VERNA (L.) Asch. 13, W. Sussex; Worthing, 1935, L. A. W. BURDER.

37/5c. ARABIS PETRAEA Lam. var. GRANDIFOLIA Druce. 88, Mid Perth.; north side of Ben Chaluim, 1940, R. MACKECHNIE and E. C. WALLACE.

†38/1. **Microsisymbrium lasiophyllum** (Hook. & Arn.) O. E. Schulz in *Das Pflanzenreich* (*Cruciferae-Sisymbriae*), iv, *105*, p. 162 (1923). *Turritis ? lasiophylla* Hook. & Arn. in *Bot. Capt. Beechey's Voyage*, 321 (1841). *Thelypodium lasiophyllum* (Hook. & Arn.) Greene in *Bull. Torr. Bot. Club*, *13*, 142 (1886). 39, Staffs.; waste ground, Worthington's maltings, Burton-on-Trent: a striking plant, erect, with pinnatifid leaves and small cream-coloured flowers and slender siliquae soon becoming deflexed after flowering time, J. P. M. BRENAN.

*39/3. CARDAMINE IMPATIENS L. 12, N. Hants.; on upper greensand, Catham copse, Bentley: reported to me in 1938 by W. E. WARREN and seen in fruit in 1939, E. C. WALLACE.

†42/10. ALYSSUM MARITIMUM (L.) Lam. 61, S.E. Yorks.; rubbish heaps, Hessle, A. K. WILSON.

43/2. DRABA RUPESTRIS R. Br. 98, Argyll; seen in small quantity on high rock face on Ben Dothaidh, 1940, E. C. WALLACE.

43/3. DRABA INCANA L. 108, W. Sutherland; rocks by Smoo Inlet, D. McCLINTOCK. 108, W. Sutherland; sandhills at Melvich, near sea level, P. M. HALL and E. C. WALLACE. *110, Outer Hebrides; Fuday, Heslop Harrison (1939: 2).

*43/4. DRABA MURALIS L. 45, Pembroke; bank of lane, near Narberth, J. W. GOUGH.

†49/3. SISYMBRIUM ALTISSIMUM L. 20, Herts.; near the Canal, Rickmansworth, F. M. DAY.

†49/4. Sisymbrium orientale L. 11, S. Hants.; wool-alien, Portchester, P. M. Hall and R. C. L. Burges. 13, W. Sussex; Southwick, 1939, confirming Hilton's record of 1891, L. A. W. Burder.

49/6b. Sisymbrium officinale (L.) Scop. var. leiocarpum DC. 29, Cambs.; edge of cornfield, Fulbourn, F. M. Day.

50/1. Erysimum cheiranthoides L. 25, E. Suffolk; Stratford St Andrews, Miss L. Abell.

†54/16. Brassica juncea (L.) Coss. 15, E. Kent; by grain mill on right bank of R. Stour, near Wye Station, J. P. M. Brenan.

†55/2. Diplotaxis muralis (L.) DC. 39, Staffs.; Weston on Trent and Newcastle under Lyme, G. J. V. Bemrose.

*†60/1. Coronopus didymus (L.) Sm. 40, Salop; Llanymynech Station, J. A. Webb; comm. Dept. Bot., Nat. Mus. Wales.

*61/5. Lepidium campestre (L.) R. Br. 110, Barra; Wilmott (1939 A: 189).

†61/8. Lepidium perfoliatum L. 54, N. Lincoln; Gainsborough, H. B. Willoughby Smith.

*†64/1. Thlaspi arvense L. 43, Radnor; Llandrindod Wells, J. A. Webb, comm. Dept. Bot., Nat. Mus. Wales.

*66/1. Teesdalia nudicaulis (L.) R. Br. 103, Mid Ebudes; near Coire nan Each, c. 1500 ft. south side of Ben More, Mull, A. Templeman, comm. A. J. Wilmott.

†74/2. Bunias orientalis L. 15, E. Kent; waste ground by R. Medway, Forstal, near Aylesford, J. P. M. Brenan.

75/1. Crambe maritima L. 25, E. Suffolk; sea shore between Dunwich and Walberswick, 1939—see Hind, *Flora of Suffolk*, wherein this plant is reported as probably extinct—F. Druce.

77/1. Cakile maritima Scop. 108, W. Sutherland; Balnakeil Bay, Durness, P. M. Hall and E. C. Wallace.

†79/1. Erucaria hispanica (L.) Druce. 16, W. Kent; waste ground. Tonbridge, J. P. M. Brenan.

*88/3. Viola Reichenbachiana Jord. 67, S. Northumberland; Dinsdale Woods and sparingly along the Devil's Water, J. W. Heslop Harrison in *Vasc.*, *25*, No. 3, 101 (*V. canina* L. is claimed (in error) as a *N.C.R.*). *103, Mid Ebudes; Coll, J. W. Heslop Harrison. *110, Outer Hebrides; cliffs, Tarbert, Harris, 1938, W. A. Clark.

88/3c. VIOLA REICHENBACHIANA Jord. forma LEUCANTHA (Čelak.). 33, E. Gloster; Dowdeswell Lane, near Andoversford, 1938, Miss L. ABELL. 36, Hereford; Purlieu Lane, Colwall, 1938, F. M. DAY.

88/4. VIOLA RIVINIANA Rchb. 103, Mid Ebudes; Coll, J. W. HESLOP HARRISON.

88/4. VIOLA RIVINIANA Rchb. forma ALBIFLORA Becker. 3, S. Devon; Scabbacombe Head, Brixham, F. M. DAY. [In contrast to most other British species of violet white-flowered forms of *V. Riviniana* are in my experience extremely rare in the wild state. A cultivated form has been distributed from Wisley by the Royal Horticultural Society under the incorrect name "*V. canina alba*" and is well known to gardeners.—P. M. HALL.]

88/4b. VIOLA RIVINIANA Rchb. var. DIVERSA Greg. 5, S. Somerset; Leigh Hill, Lowton, near Taunton, Miss M. E. EDMONDS. [This gathering was notable for the large size of the flowers and for the variation in colour of the flowers and spurs.—P.M.H.] 14, E. Sussex; downs west of Jevington, J. R. WALLIS. 36, Hereford; Tarrington Common, 1938; 37, Worcester; Kempsey Common, 1938, F. M. DAY.

*88/6. VIOLA CANINA L. 103, Mid Ebudes; coll. J. W. HESLOP HARRISON.

88/6×4. VIOLA CANINA L. × RIVINIANA Rchb. 36, Hereford; Tarrington Common, 1938, F. M. DAY. 103, Mid Ebudes; coll. J. W. HESLOP HARRISON.

88/8h. VIOLA ODORATA L. var. SUBCARNEA (Jord.) Rouy & Fouc. 36, Hereford; Chance's Pitch, Colwall, F. M. DAY.

88/9f. VIOLA HIRTA L. var. LACTIFLORA Rchb. 33, E. Gloster; Foxcote, near Andoversford, 1938, Miss L. ABELL.

88/9i. VIOLA HIRTA L. var. PROPERA (Jord.) Gillot. 14, E. Sussex; downs between Alfriston and Firle plantation, J. R. WALLIS.

88/9×8. VIOLA HIRTA L. × ODORATA L. 36, Hereford; Chance's Pitch, Colwall, F. M. DAY.

88/10. VIOLA HIRTA L. var. CALCAREA Bab. 14, E. Sussex; downs west of Jevington, J. R. WALLIS. 63, S.W. Yorks.; Stapleton Park Woods, Wentbridge, W. A. SLEDGE.

88/11. VIOLA PALUSTRIS L. forma ALBIFLORA Neum. 5, S. Somerset; Leigh Hill, Lowton, near Taunton, with the typical form, Miss M. E. EDMONDS.

88/24. Viola segetalis Jord. forma obtusifolia (Jord.) Drabble. 3, S. Devon; on the Bovey, near N. Bovey: in a cornfield, Beetor; 1938, T. Stephenson. 62, N.E. Yorks.; church-yard, Old Malton, 1938, Miss C. M. Rob.

88/26. Viola ruralis Bor. 62, N.E. Yorks.; clover field, Catton, near Thirsk, 1938, Miss C. M. Rob.

88/34. Viola Curtisii Forst. 103, Mid Ebudes; Coll, J. W. Heslop Harrison.

†10(2). Pittosporaceae Benth. & Hook. f., i, 131.

†88(2). **Pittosporum** Banks ex Gaertn., *Fruct.*, i, 286, t. 59 (1788).

†88(2)/1. **Pittosporum crassifolium** Soland. ex Putterlick, *Syn. Pittosp.*, 12 (1839). Illustrated in *Bot. Mag.*, t. 5978, from Tresco material. Native of New Zealand. 1a, Scillies; near Old Town, St Mary's (Lousley, 1939 C).

89/4. Polygala oxyptera Rchb., det. A. J. Wilmott. 16, W. Kent; near Lamberhurst, J. R. Wallis.

†92/8. Dianthus Caryophyllus L. 41, Glam.; on shingle, Crymlyn Bay, J. A. Webb, comm. Dept. Bot., Nat. Mus. Wales.

†94/6. **Gypsophila scorzonerifolia** Ser. in DC. *Prodr.*, i, 352 (1824). Orient and Hortal. 34, W. Gloucester; tip, Fishponds, Bristol, 1936, C. I. Sandwith. *G. acutifolia* Fisch. var. *latifolia* Fenzl in Ledeb. *Fl. Ross.*, i, 296 (1842), appears to represent the same plant, which has sometimes been known in gardens or books on garden plants as *G. perfoliata* L. or *G. acutifolia* Fisch.—N. Y. Sandwith.

96/8. Silene acaulis L. 92, S. Aberdeen; on the plateau above Cairn Lochan at 4000 ft., a form with pure white flowers, C. Leighton Hare and J. G. Roger. [There are old references to this white form from the Cairngorms but, as far as I can trace, it has not been recorded previously from this locality.—C.L.H.] 108, W. Sutherland; on the cliffs, Faraid Head, 1938, D. McClintock.

†96/14. Silene subconica Friv. (*S. juvenalis* Del.). 6, N. Somerset; waste ground, Bristol, C. I. Sandwith. New to the Bristol list. For the identity of *S. juvenalis*, which was described from adventive material collected at Port Juvenal, France, see a paper by W. B. Turrill in *Kew Bull.*, 1933, pp. 40-44.—N. Y. Sandwith.

*100/9. Cerastium tetrandrum Curt. 23, Oxon.; among stones by the railway line between Wolvercote Bridge and the Junction, J. P. M. Brenan.

*101/4. STELLARIA NEGLECTA Weihe. 25, E. Suffolk; hedgebank, Huntingfield, near Halesworth, 1940, Miss M. M. WHITING and N. Y. SANDWITH.

*101/7. STELLARIA GRAMINEA L. 110, Outer Hebrides; N. Harris, A. J. WILMOTT (M. S. Campbell: *Journ. Bot.*, *78*, 101: 1940).

*102/3. ARENARIA NORVEGICA Gunn. 104, Rhum; W. A. Clark (1939: 5).

103/1. SAGINA NODOSA (L.) Fenzl. 32, Northants.; Southorpe, 1938, a vegetative non-flowering form, evidently the same as that described by Davey, *Fl. Cornw.*, 80 (1909), Mrs C. L. WILDE.

103/1b. SAGINA NODOSA (L.) Fenzl var. GLANDULOSA (Bess.). 39, Staffs.; Penkhull, G. J. V. BEMROSE.

103/7. SAGINA CILIATA Fr. 61, S.E. Yorks.; Houghton Woods (det. H. W. Pugsley), A. K. WILSON.

†107/1. PORTULACA OLERACEA L. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

†108/1. CLAYTONIA ALSINOIDES Sims. 69, Westmorland; near Colwith, H. B. WILLOUGHBY SMITH.

†108/2. CLAYTONIA PERFOLIATA Donn. *39, Staffs.; Burston, G. J. V. BEMROSE. 61, S.E. Yorks.; Brough, A. K. WILSON. *67, S. Northumberland; Stocksfield, 1906, H. K. WALLACE, comm. A. E. ELLIS. *94, Banff; Colleonard, near Banff, Miss M. McC. WEBSTER.

†112/3. HYPERICUM HIRCINUM L. 3, S. Devon; near Coombe Cellars, Haccombe, G. T. FRASER; near Treby, Yealmpton, E. M. PHILLIPS.

†112/5. HYPERICUM CALYCINUM L. 48, Merioneth; Penhelig, J. A. WEBB, 1940, comm. DEPT. BOT., NAT. MUS. WALES.

112/17. HYPERICUM ELODES L. 73, Kirkcudbright; Palnure, near Newton Stewart, 1940, R. MACKECHNIE.

†113/2. MALOPE TRIFIDA Cav. 23, Oxon.; waste ground, Port Meadow, Oxford, DE ROUSSET HALL and J. P. M. BRENAN.

†116/8. LAVATERA TRIMESTRIS L. 23, Oxon.; rubbish tip, Port Meadow, Oxford, 1940, J. P. M. BRENAN and N. E. G. CRUTTWELL.

†116/11. **Lavatera plebeia** Sims, *Bot. Mag.*, t. 2269 (1821). Native of Australia: closely resembling *L. cretica* L., but distinguished by the short scurfy indumentum of the stems and calyx. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. B. L. BURTT, N. Y. SANDWITH and V. S. SUMMERHAYES.

†117/6. MALVA AMBIGUA Guss. 16, W. Kent; waste ground, Tonbridge, J. P. M. BRENAN.

†117/7. MALVA NICAEENSIS All. 39, Staffs.; Worthington's Maltings, Burton-on-Trent, J. P. M. BRENAN.

†118(2). **Anoda** Cav. *Diss.*, i, 38 (1785).

†118(2)/1. **Anoda cristata** (L.) Schlecht. in *Linnaea*, xi, 210 (1837) var. **brachyantha** (Rchb.) Hochr. in *Ann. Conserv. Jard. Bot. Genève*, xx, 47 (1916). *Sida cristata* L., *Sp. Pl.*, ed. i, 685 (1753). *Anoda hastata* Cav., *l.c.*, 38, t. 11, f. 2. *A. brachyantha* Rchb., *Icon. Bot. Exot.*, 24, t. 34 (1827). Alien, native of America (perhaps of Temperate S. America), widely cultivated in the tropics. 6, N. Somerset; waste ground, Bristol, Oct. 1939, C. I. SANDWITH, det. N. Y. SANDWITH. Flowers small, pale lilac-mauve.

†122/1. HIBISCUS TRIONUM L. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

125/1. LINUM BIENNE Mill. 16, W. Kent; near Lamberhurst, J. R. WALLIS. [This is almost certainly the station described as " between Hook Green and Lamberhurst " by E. Jenner in a *Flora of Tunbridge Wells* (1845): the record was not taken up in Hanbury & Marshall's *Flora of Kent*, probably because the locality was thought to be in Sussex: indeed, when preparation of that work began, Hook Green and half of Lamberhurst were in Sussex, but before publication a boundary change placed both villages in Kent. Jenner's record was incorrectly included in the recent *Sussex Flora* but with a note doubting whether the plant still belonged to the county. Actually, if my locality and Jenner's are the same, it has always been on the Kentish side of the boundary.—J.R.W.—In any case, changes in county political boundaries do not affect the boundaries of the vice-counties.—A. J. WILMOTT.]

†125/4. LINUM USITATISSIMUM L. 39, Staffs.; Tileries at Spring Fields, Stoke-on-Trent, E. S. EDEES.

127/4. GERANIUM PRATENSE L. 14, E. Sussex; foot of the downs, near Blackcap, Plumpton, E. C. WALLACE.

†127/6. GERANIUM ENDRESSI Gay. 16, W. Kent; streamside near Bayham, J. R. WALLIS.

†127/24. GERANIUM IBERICUM Cav. 41, Glam.; near the Golf Course club-house, Jersey Marine, J. A. WEBB. There is an old record for *G. sylvaticum* from this region. *G. ibericum* was probably mistaken for it, comm. DEPT. BOT., NAT. MUS. WALES.

†128/2. ERODIUM MOSCHATUM (L.) L'Hérit. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†128/5. ERODIUM BOTRYS (Cav.) Bertol. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH.

†128/14. ERODIUM CYGNORUM Nees. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH.

*†133/2. IMPATIENS BIFLORA Walt. 34, West Gloucester; Berkeley Canal, Slimbridge, CHARLES THOMAS (1941: *Proc. Cotteswold Nat. F.C.*, 1940, *27*, 111).

†133/3. IMPATIENS PARVIFLORA DC. 9, Dorset; Dorchester, Miss MEGGESON, comm. P. M. HALL. 20, Herts.; Jewson's Timber-yard, Hertford, D. MCCLINTOCK. 29, Cambs.; in a yard off Portugal Street, Cambridge. 37, Worcs.; lane near Powick Church, F. M. DAY. [Add v.-c. 37 to *Com. Fl.*, but see *B.E.C. 1923 Rep.*, 179 (1924), for earlier record.—ED.] 54, N. Lincoln; Gainsborough, H. B. WILLOUGHBY SMITH.

†133/4. IMPATIENS ROYLEI Walp. 6, N. Somerset; bank of R. Avon between Newton St Loe and Weston near Bath, 1935, A. E. ELLIS. [Add to *C.F.*, but see C. I. Sandwith (1939) for previous record.—ED.]

138/1. RHAMNUS FRANGULA L. 39, Staffs.; Betley Mere, G. J. V. BEMROSE.

†142/1. ACER PSEUDO-PLATANUS L. 44, Carmarthen; Llannon, J. A. Webb, comm. DEPT. BOT., NAT. MUS. WALES. (First published record for county, not in *Welsh Flowering Plants*.)

150/1b. CYTISUS SCOPARIUS (L.) Link var. PROSTRATUS (Bailey) Hanbury. 49, Caernarvon; Pen Parwyd, Aberdaron, J. REES.

151/2. ONONIS REPENS L. 108, W. Sutherland; Farr Bay, P. M. HALL and E. C. WALLACE. (Add to *C.F.*)

151/3. ONONIS SPINOSA L. 34, W. Glos.; a form with small blue flowers, approaching the continental var. *violacea* (Peterm.) Wohlf., which differs in having tiny flowers with a very short standard. Inglestone Common, B. WELCH (cf. C. I. Sandwith, Bristol Botany in 1940).

†151/8. ONONIS MITISSIMA L. 16, W. Kent; waste ground, Tonbridge, J. P. M. BRENAN.

†152/2. TRIGONELLA FOENUM-GRAECUM L. 39, Staffs.; Tileries at Spring Fields, Stoke-on-Trent, E. S. EDEES, det. F. RILSTONE.

†153/1. MEDICAGO FALCATA L. 3, S. Devon; Exmouth, S. EDWARDS, comm. G. T. FRASER. 39, Staffs.; waste land, North Street, Stoke-on-Trent, E. S. EDEES: Audley, G. J. V. BEMROSE.

†153/4b. Medicago hispida Gaertn. var. denticulata (Willd.) G. & G. 11, S. Hants.; wool-alien, Portchester, P. M. Hall and R. C. L. Burges.

†153/6. Medicago minima (L.) Bartal. 16, W. Kent; waste ground, Tonbridge: approaching var. *longiseta* DC., spines of legume longer than usual, but by no means extreme, J. P. M. Brenan.

*†153/6d. Medicago minima (L.) Bartal. var. recta (Desf.) Burnat. 11, S. Hants.; wool-alien, Portchester, P. M. Hall and R. C. L. Burges.

†154/3. Melilotus arvensis Wallr. 39, Staffs.; waste land, North Street, Stoke-on-Trent, E. S. Edees.

†154/4. Melilotus indica (L.) All. 13, W. Sussex; Kingston by Sea, L. A. W. Burder. 17, Surrey; Epsom College Farm, 1937. 27, E. Norfolk; Hellesdon, near Norwich, 1934, A. E. Ellis. 39, Staffs.; Leek, G. J. V. Bemrose.

*†155/6. Trifolium stellatum L. 14, E. Sussex; The Crumbles, Eastbourne, 1938, Mrs Morten, comm. A. H. Wolley-Dod.

†155/17. Trifolium glomeratum L. 11, S. Hants.; among wool-aliens in an arable field, Portchester, P. M. Hall and R. C. L. Burges.

*155/20. Trifolium procumbens L. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 2).

*155/22. Trifolium filiforme L. 74, Wigtown; Galloway, above Morroch Bay, 1937, A. J. Wilmott.

160/4b. Lotus uliginosus Schkuhr var. glaber Bréb. 1, W. Cornwall; moor between Sennen and Brew, 1926, A. E. Ellis. 17, Surrey; Epsom, 1931, I. B. Barton, comm. A. E. Ellis. 32, Northants; Welford, 1922: 55, Leics.; Market Harborough, 1920, A. E. Ellis.

166/1. Astragalus glycyphyllos L. 12, N. Hampshire; Micheldever Wood, 1940, P. M. Hall, E. C. Wallace, and A. J. Wilmott.

*166/3. Astragalus danicus Retz. 12, N. Hampshire; near Danbury, 1940, W. A. Payn, comm. P. M. Hall, see Hall in *Proceedings of the Hampshire Field Club and Archaeological Society*, xv, 65.

†170/1. Coronilla varia L. 14, E. Sussex; Newhaven, 1933, omitted from *Flora of Sussex*, 1937, L. A. W. Burder.

*176/1. Vicia sylvatica L. 103, Mid Ebudes; below Ton Dubhsgairt, s.w. of Balmeanach, Gribun, Mull, A. Templeman, comm. A. J. Wilmott.

176/4. Vicia Orobus DC. 108, W. Sutherland; in plenty and great variety of colour by road between Lochinver and Stoer, P. M.

Hall and E. C. Wallace. *110, Outer Hebrides; Eriskay, Heslop Harrison (1939: 2).

*†176/9. Vicia lutea L. 45, Pembroke; barley field, Tenby, 1940, Mrs F. L. Rees, comm. Dept. Bot., Nat. Mus. Wales.

†176/26b. Vicia pannonica Crantz var. striata (MB.). 45, Pembroke; barley field, Tenby, 1940, Mrs F. L. Rees, comm. Dept. Bot., Nat. Mus. Wales.

†176/27b. Vicia melanops Sibth. et Sm. var. **Davidovi** Vel. in *Oest. Bot. Zeitschr.*, lii, 50 (1902), ex descr. det. B. L. Burtt at Kew. Alien, Bulgaria. 6, N. Somerset; waste ground, Bristol, July 1939, C. I. Sandwith. Standard yellowish, curved back; wings pure white. Differs from the typical plant in the smaller flowers which are differently coloured, lacking the curious blackish tint of the wings and keel. The white-tipped wings of the Bristol plant indicate that it is a form without anthocyanin.

178/2. Lathyrus sylvestris L. 66, Durham; Hartlepool, 1906, H. K. Wallace, comm. A. E. Ellis. [Knowledge of its status in this locality would be useful; bracketed for 66 in *C.F.*—Ed.]

†178/3. Lathyrus tuberosus L. 9, Dorset; Middle Farm, Dorchester, Miss Meggeson, comm. P. M. Hall.

†178/20. Lathyrus hierosolymitanus Boiss. 39, Staffs.; Worthington's Maltings, Burton-on-Trent, J. P. M. Brenan.

178/25b. Lathyrus montanus Bernh. var. tenuifolius (Roth) Garcke. 67, S. Northumberland; Stocksfield, 1906, H. K. Wallace, comm. A. E. Ellis.

†180/1. Pisum arvense L. 45, Pembroke; barley field, Tenby, 1940, Mrs F. L. Rees, comm. Dept. Bot., Nat. Mus. Wales.

†180/2. Pisum elatus MB. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. Brenan.

185/43. Rubus ramosus Briggs. 3, S. Devon; Wistman's Wood, Rev. T. Stephenson and G. T. Fraser.

*185/97. Rubus fuscicortex Sudre. 3, S. Devon; Fingle Gorge, Drewsteignton, Rev. T. Stephenson.

*185/104(2). Rubus radulicaulis Sudre. 3, S. Devon; Fingle Gorge, Drewsteignton, Rev. T. Stephenson.

*185/153×47. Rubus caesius L. × ulmifolius Schott. 3, S. Devon, West Buckfastleigh, Rev. T. Stephenson.

*186/1. DRYAS OCTOPETALA L. 103, Mid Ebudes; near waterfall c. 500 ft. N. of Ton Dubh-sgairt, S.W. of Balmeanach, Gribun, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

187/2. GEUM RIVALE L. 4, N. Devon; Angler's path near Sydenham House, Marystow, F. C. MARKS, comm. E. M. PHILLIPS. *110, Outer Hebrides; N. Harris, A. J. WILMOTT (M. S. Campbell, *Journ. Bot.*, *78*, 101).

187/2×1. GEUM RIVALE L. × URBANUM L. 4, N. Devon; as above, F. C. MARKS, comm. E. M. PHILLIPS. 28, W. Norfolk; Wayland Wood, near Watton, 1931, A. E. ELLIS.

*†189/11 POTENTILLA NORVEGICA L. 37, Worcs.; abundant at Hoobrook, near Kidderminster, W. H. HARDAKER.

†189/13. POTENTILLA RECTA L. 3, S. Devon; Yealmpton, E. W. CLARKE, comm. E. M. PHILLIPS, det. KEW.

190/2. ALCHEMILLA PRATENSIS Schmidt. 3, S. Devon; roadside south of Burrator Lake, Sheepstor, F. C. MARKS and E. M. PHILLIPS.

190/4. ALCHEMILLA PSEUDOMINOR Wilmott. 4, N. Devon; Clovelly, A. L. STILL, det. A. J. WILMOTT.

191/2. AGRIMONIA ODORATA (Gouan) Mill. *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 2). H. 35, N. Donegal; Marble Hill, Sheep Haven, W. A. SLEDGE.

†192/1. ACAENA ANSERINIFOLIA (J. R. & G. Forst.) Druce. 37, Worcs.; fields near Kidderminster, W. H. HARDAKER, det. N. Y. SANDWITH.

193/4. POTERIUM OFFICINALE (L.) A. Gray. 34, W. Gloucester; in fields near Earthcott Green, between Iron Acton and Alveston, B. WELCH. A first record for the Bristol district. See White, *Fl. Bristol*, p. 36, where it appears in a list of plants " not improbably natives of the district " and to be looked for. Its discovery in a perfectly natural habitat so close to the city is remarkable.

†193/5. POTERIUM CANADENSE (L.) A. Gray. 14, E. Sussex; garden escape, by stream, Bayham, J. R. WALLIS.

194/7h. ROSA CANINA L. var. DUMALIS (Bechst.) Dum. forma VIRIDICATA (Pug.) Rouy. 16, W. Kent; Mount Pleasant, near Lamberhurst, J. R. WALLIS, det. A. H. WOLLEY-DOD.

*194/9b. ROSA CANINA L. var. BLONDAEANA (Rip.) Rouy forma VINACEA (Baker) Rouy. Mount Pleasant, near Lamberhurst, J. R. WALLIS, det. A. H. WOLLEY-DOD.

194/18c. ROSA OBTUSIFOLIA Desv. var. TOMENTELLA (Lém.) Baker. Mount Pleasant, near Lamberhurst, J. R. WALLIS, det. A. H. WOLLEY-DOD.

194/23c. ROSA SPINOSISSIMA L. var. TYPICA W.-Dod forma ROSEA Koch. 41, Glamorgan; several plants with flowers of a brilliant rose colour in a restricted area amongst the typical form on a sandhill near Newton, Mrs CAMPBELL, comm. Miss E. VACHELL.

†194/27. ROSA CINNAMONEA L. 16, W. Kent; Hook Green Common, J. R. WALLIS.

*195/11. SORBUS RUPICOLA (Syme). 107, E. Sutherland; calcareous rocks, Cambusmore, near Golspie, E. C. WALLACE and P. M. HALL.

196/2. CRATAEGUS OXYACANTHOIDES Thuill. 20, Herts.; Moor Park: 21, Middlesex; Oxhey Woods: *36, Hereford; Hanway's Coppice, Colwall: 37, Worcs.; edge of Castlemorton Common: F. M. DAY.

*†197/2. COTONEASTER MICROPHYLLUS Wallich. 98, Argyll; Benderloch, 1940, WINIFRED M. LETTS, *vide* A. J. WILMOTT in *Journ. Bot.*, *78*, 199.

*†197/3. COTONEASTER SIMONSII Baker. 98, Argyll; Benderloch, 1940, WINIFRED M. LETTS, *vide* A. J. WILMOTT in *Journ. Bot.*, *78*, 199.

*199/7. SAXIFRAGA PLATYPETALA Sm., det. A. J. WILMOTT. 103, Mid Ebudes; with *Dryas*, north of Ton Dubh-sgairt, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

199/17. SAXIFRAGA GRANULATA L. 21, Middlesex; grassy banks close to Hampton Court Palace, 1940, E. C. WALLACE.

203/1. CHRYSOSPLENIUM ALTERNIFOLIUM L. 47, Montgomery; near Berriew, Miss S. HAINES.

†204/2. ESCALLONIA MACRANTHA Hooker & Arnott in *Bot. Misc.*, iii, 341 (*cf. Bot. Mag.*, t. 4473). 1a, Scillies; Middle Town, St Agnes (Lousley 1939: C).

205/1. PARNASSIA PALUSTRIS L. 39, Staffs.; Ipstones Edge, E. S. EDEES.

213/1×3. ×DROSERA OBOVATA Mert. & Koch. 108, W. Sutherland; swamps at Rhiconich and Scourie, P. M. HALL and E. C. WALLACE.

213/2. DROSERA LONGIFOLIA L. 73, Kirkcudbright; Palnure near Newton Stewart, 1940, R. MACKECHNIE.

214/1. HIPPURIS VULGARIS L. 109, Caithness; shore of Loch Winless, among *Potentilla palustris* and *Carex* spp., E. C. WALLACE.

†215/3. **Gunnera manicata** Linden in *Illustr. Hortic.*, xx (1873), 156. Alien, S. America: Colombia. 35, Monmouth; banks of R. Usk near Llangibby, 1938, comm. A. Rowland per Dept. Bot., Nat. Mus. Wales.

216/2b. Myriophyllum alterniflorum DC. var. americanum Pugsl. 72, Dumfries; Castle Loch, Lochmaben, July 1901, J. B. Duncan, comm. E. C. Wallace.

217/5d. Callitriche intermedia Hoffm. var. homoiophylla G. & G. 3, S. Devon; in R. Bovey, Lustleigh, F. M. Day.

217/5e. Callitriche intermedia Hoffm. var. pedunculata (DC.) Druce. *45, Pembroke; Llambed near Mathry, A. E. Wade, B.E.C. Excursion. 65, N.W. Yorks.; Semmerwater, W. A. Sledge.

*217/6. Callitriche autumnalis L. H. 16, W. Galway; Renvyle, W. A. Sledge.

*†219/2. Lythrum Hyssopifolia L. 38, Warwickshire; California dump, near Harborne, W. H. Hardaker.

220. Epilobium L. Determined (or determinations confirmed) by G. M. Ash.

220/3×4. Epilobium hirsutum L. × parviflorum Schreb. 28, W. Norfolk; Hargham Heath near Attleborough, 1930, A. E. Ellis. 65, N.W. Yorks.; Sutton Howgrave, C. M. Rob, comm. W. A. Sledge.

220/3×10. Epilobium hirsutum L. × montanum L. 31, Hunts.; Monks Wood, S. A. Taylor.

220/4×5. Epilobium parviflorum Schreb. × tetragonum L. em. Curt. (×E. Weisenburgense F. Schultz). 16, W. Kent; waste ground, High Brooms, J. P. M. Brenan.

220/6. Epilobium Lamyi F. Schultz. 16, W. Kent; waste ground, Tonbridge: waste ground, Sevenoaks: waste ground, High Brooms: field at foot of the chalk downs near Upper Halling; J. P. M. Brenan. *31, Hunts.; Monks Wood, S. A. Taylor.

†220/7(2). Epilobium adenocaulon Hausskn. *15, E. Kent; by a pool, Denge Beach, 1936, J. E. Lousley and E. C. Wallace; wood between Sandling Junction and Westenhanger, J. P. M. Brenan. 16, W. Kent; waste ground, Green Street Green: waste ground, Sevenoaks: waste ground, High Brooms: Trench Wood, Tonbridge: in abundance by the R. Medway near Hartlake Bridge (N.E. of Tudeley Hale); J. P. M. Brenan. This is recorded for Tonbridge in *B.E.C. 1938 Rep.*, 41 (1939), but the statement that this record restores the plant for v.-c. 16 is inaccurate, as the cancelled record was *not* a new comital record. The first published record of this species in West Kent is that in Ash and

Sandwith (1935: *Journ. Bot.*, *73*, 179). A subsequent one is J. E. Lousley's (*Journ. Bot.*, *73*, 257). *31, Hunts.; Monks Wood, S. A. TAYLOR.

220/7(2)×3. EPILOBIUM ADENOCAULON Hausskn. × HIRSUTUM L. 17, Surrey; marshy roadside, Chiddingfold, 1939, J. P. M. BRENAN.

220/7(2)×10. EPILOBIUM ADENOCAULON Hausskn. × MONTANUM L. 16, W. Kent; by path in Trench Woods, Tonbridge, J. P. M. BRENAN. 31, Hunts.; Monks Wood, S. A. TAYLOR.

220/7(2)×7. EPILOBIUM ADENOCAULON Hausskn. × OBSCURUM Schreb. 15, W. Kent; wood between Sandling Junction and Westenhanger, J. P. M. BRENAN. 17, Surrey; roadside marsh near Chiddingfold, 1938. J. P. M. BRENAN. 31, Hunts.; Monks Wood, S. A. TAYLOR.

220/7(2)×4. EPILOBIUM ADENOCAULON Hausskn. × PARVIFLORUM Schreb. 16, W. Kent; by path in Trench Woods, Tonbridge, J. P. M. BRENAN.

*220/8. EPILOBIUM ROSEUM Schreb. 45, Pembroke; garden weed, Haverfordwest, 1930, A. E. ELLIS.

220/9. EPILOBIUM LANCEOLATUM Seb. & Maur. 16, W. Kent; old masonry by roadside, Lyons' Crescent, Tonbridge, J. P. M. BRENAN.

220/10×7. EPILOBIUM MONTANUM L. × OBSCURUM Schreb. (×E. AGGREGATUM Čelak.). 16, W. Kent; roadside bank, Starve Crow Hill, near Tonbridge: waste ground, High Brooms; J. P. M. BRENAN. 31, Hunts.; Monks Wood, S. A. TAYLOR.

220/10×4. EPILOBIUM MONTANUM L. × PARVIFLORUM Schreb. 32, Northants; Pipewell Woods, S. A. TAYLOR.

220/10×8. EPILOBIUM MONTANUM L. × ROSEUM Schreb. 62, N.E. Yorks.; Catton, near Thirsk, C. M. ROB, comm. W. A. SLEDGE.

220/12. EPILOBIUM ALSINIFOLIUM Vill. *103, Mid Ebudes; near Ton Dubh-sgairt, and Abhaime Dhiseig, N.W. of Ben More, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT. *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 2).

†223/3. OENOTHERA STRICTA Ledeb. (*O. odorata* auct. non Jacq.). 2, E. Cornwall; Bude sandhills, A. L. STILL.

225/3. CIRCAEA ALPINA L. 103, Mid Ebudes; north of Ton Dubh-sgairt (S.W. of Balmeanach, Gribun), Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

†236/1. TETRAGONIA EXPANSA Murr. 17, Surrey; several plants on waste ground near West Byfleet, F. DRUCE.

*†240/1. ASTRANTIA MAJOR L. 8, S. Wilts.; abundant as a weed of cultivated land, Morgan's Vale, Downton, H. J. GODDARD.

245/3. BUPLEURUM ROTUNDIFOLIUM L. 23, Oxon; farmland, Chadlington, Lady ROCHE. 66, Durham; Hartlepool, 1906, H. K. WALLACE, comm. A. E. ELLIS.

247/5. APIUM INUNDATUM (L.) Rchb. fil. 16, W. Kent; quite rare about Lamberhurst, J. R. WALLIS.

†249/1. AMMI MAJUS L. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†249/2. AMMI VISNAGA (L.) Lam. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH.

*250/2. CARUM VERTICILLATUM (L.) Koch. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 2).

*253/2. SIUM ERECTUM Huds. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 2).

*†261/3. ANTHRISCUS CEREFOLIUM (L.) Hoffm. 3, S. Devon; Ipplepen, Bulleigh Barton, roadside hedge in some quantity, G. T. FRASER and T. STEPHENSON, det. A. J. WILMOTT.

264/1. CRITHMUM MARITIMUM L. 25, E. Suffolk; sea shore between Dunwich and Walberswick, F. DRUCE.

265/2. OENANTHE FLUVIATILIS Coleman. 6, N. Somerset; in the Kennet and Avon canal between Bath and Bathampton, 1940, C. I. and N. Y. SANDWITH.

*271/1. LIGUSTICUM SCOTICUM L. H. 16, West Galway; Slyne Head. W. A. SLEDGE.

†276/5. PEUCEDANUM OSTRUTHIUM (L.) Koch. 81, Berwick; Longformachus, ("known many years") Miss BROWN, comm. A. H. WOLLEY-DOD.

277/2b. HERACLEUM SPHONDYLIUM L. var. ANGUSTIFOLIUM Huds. 33, E. Gloster.; near Cranham, F. DRUCE. 42, Brecon; damp wood near Wye, Llangoed, 1936, A. E. ELLIS.

†279/1. CORIANDRUM SATIVUM L. 39, Staffs.; Tileries at Spring Fields, Stoke-on-Trent, E. S. EDEES.

†283/2. CAUCALIS DAUCOIDES L. 14, E. Sussex; Newhaven, 1929, L. A. W. BURDER.

†283/8. Caucalis latifolia L. 9, Dorset; cornfield on chalk, Dorchester, 1883, J. Sims, comm. A. E. Ellis.

†287/2b. Sambucus nigra L. var. laciniata L. 17, Surrey; small tree, Merstham, F. Druce. 48, Merioneth; near Pennal, 1940, J. A. Webb, comm. Dept. Bot., Nat. Mus. Wales.

288/2. Viburnum Lantana L. 4, N. Devon; Marystow, F. C. Marks and E. M. Phillips; Castle Hill, Filleigh, Lady Eleanor Fortescue (fl. ca. 1835)—marginal note in her copy of *Fl. Devoniensis*, 1829, comm. G. T. Fraser.

301/1b. Valeriana officinalis L. forma latifolia (Vahl.) Drabble. 16, W. Kent; near Paddock Wood: near Tudeley, J. R. Wallis, det. B. L. Burtt.

304/1b. Valerianella Locusta (L.) Betcke var. lasiocarpa (Rchb.). 16, W. Kent; bank of R. Medway below Branbridges, J. R. Wallis, det. B. L. Burtt.

†304/2. Valerianella eriocarpa Desv. 4, N. Devon; Saunton, Braunton, in cultivated ground among houses, 1931, C. and N. Y. Sandwith.

306/2. Dipsacus pilosus L. 41, Glamorgan; banks of R. Ddaw, near Llandough-juxta-Cowbridge, Mrs Francis, comm. Miss E. Vachell. [This plant was recorded in the *Flora of Glamorgan* (1908) as abundant and thoroughly naturalised in a thicket of rhododendrons on the outskirts of Llandough Castle, probably introduced with them. It has recently been discovered in great abundance on the opposite side of the valley. I have examined the locality carefully and consider that as it occurs on a rough hillslope near a natural copse associated with *Dipsacus sylvestris*, *Campanula Trachelium*, and other native species over a considerable area in very similar surroundings to those in which it is considered native in Herefordshire, Surrey, etc., it may be accepted as native in Glamorgan. There seems little reason to suppose that the fruits of any composite plant would have been carried down-stream and then have been dispersed by wind to the opposite side of the valley. Movements of farm cattle are the only possible solution of its increase if it is not accepted as native.—E.V.]

308/1. Scabiosa Columbaria L. 4, N. Devon; Castle Hill, Filleigh, Lady Eleanor Fortescue (fl. ca. 1835)—marginal note in her copy of *Fl. Devoniensis*, 1829, comm. G. T. Fraser.

†315/2. Calotis hispidula F. von Muell. 11, S. Hants.; wool-alien, Portchester, P. M. Hall and R. C. L. Burges.

†320/3. Erigeron canadensis L. 39, Staffs.; London Road Institution, Stoke-on-Trent, G. J. V. Bemrose.

†320/4. ERIGERON CRISPUS Pourr. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH.

328/4. GNAPHALIUM NORVEGICUM Gunn. 90, Angus; remove brackets in *C.F.*: recorded in *Top. Bot.*, collected by E. F. Linton in 1883 and 1884, and seen by me in 1934, E. C. WALLACE.

*†333/1. INULA HELENIUM L. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 3).

334/2. PULICARIA VULGARIS Gaertn. 8, S. Wilts.; clayey commons near Devizes, Poulshot, 1925, C. D. HEGINBOTHOM, abundant in 1939, J. D. GROSE, Marston, scarce, J. D. GROSE.

†339/4. AMBROSIA TRIFIDA L. 15, E. Kent; by a grain mill on the right bank of the R. Stour near Wye railway station, J. P. M. BRENAN.

†339/4(2). **Ambrosia aptera** DC., *Prod.*, v, 527 (1836). 18, S. Essex; dump, Dagenham Dock, Rev. P. H. COOKE, No. 1619, det. R. A. BLAKELOCK at Kew, comm. N. Y. SANDWITH.

†341(2)/2. **Siegesbeckia cordifolia** H. B. K., *Nov. Gen. et Sp.*, *4*, 283 (1820). Native of Mexico, Chile and Colombia. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

353/1b. BIDENS CERNUA L. var. RADIATA DC. 27, E. Norfolk, Thorpe St Andrew, Norwich, 1932; Elsing, 1935; A. E. ELLIS.

†353/6b. BIDENS FRONDOSA L. var. **anomala** Porter ex Fernald in *Rhodora*, *5*, 91 (1903); Sherff, *Mon. Bidens*, 243, pl. lxii, f. i (1937). Alien, North America. 34, W. Gloucester; waste ground, Gloucester, J. W. HAINES, det. N. Y. SANDWITH. Differs from the typical form in the awns of the achenes being antrorsely, not retrorsely, hispid. British botanists should search for it in their material of *B. frondosa*.

†354/2b. GALINSOGA QUADRIRADIATA Ruiz. & Pav. var. HISPIDA (DC.) Thell. 20, Herts.; Hertford, D. MCCLINTOCK, det. J. P. M. BRENAN.

†380/3. PETASITES FRAGRANS Presl. 14, E. Sussex; abundantly at Ticehurst House, Ticehurst: 15, E. Kent; Milsted: 16, W. Kent; between Matfield and Kippings Cross: a garden escape in each case and only plants with sub-male heads seen, J. R. WALLIS.

†380/4. **Petasites japonicus** (Sieb. et Zucc.) F. Schmidt, *Reisen im Amurlande*, 145 (1868). *Nardosmia japonica* Sieb. et Zucc. in *Abh. Akad. Muench.*, iv, iii, 181 (1846). Native of Sakhalin. Frequently cultivated. 58, Cheshire; beside lake at Thornton Hough (Hardy 1940: A). It has been found previously, in 24, Bucks., on the gravels of an island in the Misbourne near Denham golf course (E. A. BARTON, 1924), also as

an escape outside a garden in 69, Westmorland, at Langdale (Sir SIDNEY HARMER and Rear-Adm. R. CLINTON-BAKER, 1931), comm. A. J. WILMOTT.

*†381/1. DORONICUM PARDALIANCHES L. 39, Staffs.; roadside near Ashley, E. S. EDEES.

†383/7. SENECIO SQUALIDUS L. 13, W. Sussex; Shoreham, 1938, E. D. MORGAN, comm. A. H. WOLLEY-DOD. *17, Surrey (Salmon, *Flora*: 1931, 395). Add to *C.F.* 39, Staffs.; Madeley, G. J. J. BEMROSE. *48, Merioneth; Barmouth Junction, 1940, J. A. WEBB, comm. DEPT. BOT., NAT. MUS. WALES.

†383/8. SENECIO VISCOSUS L. *18, S. Essex; Wanstead, 1920, A. E. ELLIS. 107, E. Sutherland; railway track, Loth, near Helmsdale, E. C. WALLACE.

383/9. SENECIO SYLVATICUS L. 17, Surrey; Barnes Common, 1823, 13 years before the first record in Salmon's *Flora of Surrey*, A. W. FRANKS, comm. A. E. ELLIS.

383/9b. SENECIO SYLVATICUS L. var. AURICULATUS Meyer. 39, Staffs.; Massey Square, Burslam, G. J. V. BEMROSE.

†386/1. CRYPTOSTEMMA CALENDULACEUM (L.) R. Br. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

393/2. ARCTIUM VULGARE (Hill) Evans. 41, Glamorgan; Aberdulais, Miss E. VACHELL. *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 3): Barra, A. J. Wilmott (1939 B: 190).

393/3. ARCTIUM MINUS (Hill) Bernh. 14, E. Sussex; Lewes 1933, Winchelsea 1939, L. A. W. BURDER.

395/1. CARDUUS NUTANS L. 39, Staffs.; Consall Forge, G. J. V. BEMROSE.

†395/3b. CARDUUS TENUIFLORUS Curtis. 11, S. Hants.; among wool-aliens in a market-garden field, Portchester, P. M. HALL and R. C. L. BURGES.

396/8e. CIRSIUM ARVENSE (L.) Scop. var. SETOSUM C. A. Mey. 35, Monmouth; Pontypool, Sister M. ALBERTINE, comm. DEPT. BOT., NAT. MUS. WALES.

401/1. SAUSSUREA ALPINA (L.) DC. 108, W. Sutherland; Meall Meadhonach, c. 1200 ft., 1938, D. McCLINTOCK.

*405/11. CENTAUREA NEMORALIS Jord. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 3).

405/13d. CENTAUREA SCABIOSA L. var. SUCCISIFOLIA E. S. Marshall. 41, Glamorgan; cliffs at Lavernoch Point, E. VACHELL, det. C. E. BRITTON, who writes "plant undoubtedly var. *succisifolia.* Not the dwarf form from Nash Point but more like Marshall's Sutherland form—very interesting."

†405/31. CENTAUREA SOLSTITIALIS L. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†407/3. CARTHAMUS TINCTORIUS L. 61, S.E. Yorks.; rubbish heap, Brough, A. K. WILSON.

413/1. HEDYPNOIS CRETICA (L.) Willd. em., Boiss. 6, N. Somerset; waste ground, Bristol, C. I. SANDWITH. New to the Bristol list.

415/2. PICRIS HIERACIOIDES L. 39, Staffs.; Harpfields, Stoke-on-Trent, G. J. V. BEMROSE.

416/3. CREPIS BIENNIS L. 23, Oxon.; roadside near Menmarsh, Mrs J. P. EVETTS.

†416/9. CREPIS FOETIDA L. 6, N. Somerset; waste ground, Bristol, C. I. SANDWITH. New to the Bristol adventive list, although there are records from other parts of the area in White's *Bristol Flora.*

*†419/8. HIERACIUM BRUNNEO-CROCEUM Pugsl. 48, Merioneth; near Hengwrt and Corris, 1940, J. A. WEBB, comm. DEPT. BOT., NAT. MUS. WALES.

†419/62. HIERACIUM PRAECOX Sch.-Bip. 3, S. Devon; Churston Ferrers (Greenway), T.S., det. as a forma, H. W. PUGSLEY. This is the plant cited from this locality as *H. maculatum* Sm. in *Flora of Devon*: that entry is erroneous.—G. T. FRASER.

419/89. HIERACIUM LEPISTOIDES K. Joh. var. SUBLEPISTOIDES Zahn. 3, S. Devon; Ottery St Mary, Rev. T. STEPHENSON, det. H. W. PUGSLEY.

419/95. HIERACIUM GRANDIDENS Dahlst. 13, W. Sussex; lane near Chanctonbury, 1931, A. E. ELLIS, det. H. W. PUGSLEY.

*422/3. LEONTODON LEYSSERI (Wallr.) Beck. 110, Outer Hebrides; Heslop Harrison (1939: 3).

†425/8. LACTUCA MACROPHYLLA A. Gray. 61, S.E. Yorks.; North Cave, 1938, A. K. WILSON.

430/2. **Scorzonera hispanica** L., *Sp. Pl.*, 791, 1753. Native of Southern Europe. 34, W. Glos.; on waste ground by Portway, Bristol, I. EVANS, comm. C. I. and N. Y. SANDWITH.

†435/4. CAMPANULA RAPUNCULOIDES L. 41, Glamorgan; on railway bank near Kenfig, Miss THOMAS.

435/8. CAMPANULA PATULA L. 36, Hereford; White House Farm, Cradley, F. M. DAY.

*439/1. OXYCOCCUS QUADRIPETALUS Gilib. 45, Pembroke; near Llanerch, Gwain Valley, A. E. WADE, B.E.C. Excursion.

†443/1. GAULTHERIA SHALLON Pursh. 17, Surrey; pinewood near Farnham, 1940, E. C. WALLACE.

†452/2. **Rhododendron luteum** Sweet, *Hort. Brit.*, ed. ii, 343 (1830). *R. flavum* Don. A shrub about 2-3 m. high with young shoots viscid-puberulent; flowers yellow, appearing in May; stamens exserted: native of the Caucasus. 24, Bucks.; in quantity over a considerable area among beeches and oaks on heathland, Burnham Beeches, J. P. M. BRENAN.

*453/1b. PYROLA ROTUNDIFOLIA L. var. ARENARIA Koch. 41, Glamorgan; Kenfig, J. LORD, comm. DEPT. BOT., NAT. MUS. WALES.

*456/1. MONOTROPA HYPOPITYS L. 51, Flint.; near Cilcain, 1940, J. A. WHELLAN, comm. DEPT. BOT., NAT. MUS. WALES.

459/1. HOTTONIA PALUSTRIS L. 39, Staffs.; Stafford, V. GOODIER, comm. G. J. V. BEMROSE. 61, S.E. Yorks.; Figham Common, Beverley, A. K. WILSON.

469/1. SAMOLUS VALERANDI L. 37, Worcs.; wet coppice at edge of Castlemorton Common, F. M. DAY.

473/2. VINCA MINOR L. 39, Staffs.; roadside, Audley, Alsager, G. J. V. BEMROSE.

477/1. BLACKSTONIA PERFOLIATA (L.) Huds. 13, W. Sussex; woodland glade on weald clay near Loxwood, 1940, E. C. WALLACE.

478/1. CENTAURIUM UMBELLATUM Gilib. 39, Staffs.; Stafford Avenue, Clayton, E. S. EDEES.

480/4. GENTIANA AMARELLA L. 39, Staffs.; Ipstones Edge, E. S. EDEES.

480/6. GENTIANA ANGLICA Pugsl. 7, N. Wiltshire; Chiseldon, D. McCLINTOCK.

†497/3. SYMPHYTUM ORIENTALE L. 6, N. Somerset; Batheaston, A. E. WHITE, comm. DEPT. BOT., NAT. MUS. WALES.

†503/1. PULMONARIA OFFICINALIS L. 7, N. Wilts.; Hazeland, J. D. GROSE. [Add to *C.F.*; for previous records see Preston, *Fl. Wilts.*, 206, 1888.—J.D.G.] *47, Montgomery; near Berriew, Miss S. HAINES.

506/2. MYOSOTIS BREVIFOLIA C. E. Salmon. *62, N.E. Yorks.; Castleton, C. M. ROB, comm. W. A. SLEDGE. 64, M.W. Yorks.; Great Wham, Mengher, Nidderdale, W. A. SLEDGE, both plants confirmed by A. E. WADE.

506/7. MYOSOTIS SYLVATICA (Ehrh.) Hoffm. 14, E. Sussex; copse on the Downs near Clayton Holt, E. C. WALLACE. 17, Surrey; woodland, Headley, 1924, A. P. SNELL, comm. A. E. ELLIS.

507/2. LITHOSPERMUM PURPUREO-CAERULEUM L. 3, S. Devon; Warleigh, Tamerton Foliot, E. M. PHILLIPS.

†507/3. LITHOSPERMUM ARVENSE L. 3, S. Devon; Kingsteignton, G. T. FRASER. 4, N. Devon; Castle Hill, Filleigh, Lady ELEANOR FORTESCUE (fl. ca. 1835)—marginal note in her copy of *Fl. Devoniensis*, 1829, comm. G. T. FRASER. 14, E. Sussex; cornfield S. of Jevington, J. R. WALLIS.

†507/3b. LITHOSPERMUM ARVENSE L. var. **caeruleum** Coss. et Germ., *Fl. Env. Paris*, ed. 2, 329 (1861); *L. arvense* subvar. *caeruleum* (Coss. et Germ.) Rouy, *Fl. France*, x, 316 (1908). 61, S.E. Yorks.; King George Dock, Hull, A. K. WILSON, det. KEW. (Not an addition to the *B.P.L.*, as "var. *medium* (Chev.)" Druce is the same thing, Druce not following the International Rules.—N.Y.S.).

*511/1. CALYSTEGIA SEPIUM (L.) R. Br. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 3).

†513/1(2). **Convolvulus hirsutus** MB., *Fl. Taur.-Cauc.*, i, 422 (1808). Alien, eastern Medit. Reg. 36, Hereford; left bank of R. Wye, near Hereford, R. D. WEBB, det. N. Y. SANDWITH.

†518/7. PHYSALIS PERUVIANA L. 20, Herts.; waste garden ground, Radlett, N. E. G. CRUTTWELL.

†519/1. NICANDRA PHYSALOIDES Gaertn. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH.

†522/2. DATURA INERMIS Jacq. (*D. laevis* L. fil.). 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

†524/1b. HYOSCYAMUS NIGER L. var. PALLIDUS Waldst. & Kit. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

527/3. VERBASCUM THAPSUS L. 39, Staffs.; between Northwood and Hanford, E. S. EDEES.

†527/4. VERBASCUM VIRGATUM Stokes in With. 16, W. Kent; waste ground, High Brooms, J. P. M. BRENAN.

527/7b. VERBASCUM LYCHNITIS L. var. ALBUM (Mill.) Koch. 16, W. Kent; sandpit and neighbouring railway embankment between Sevenoaks Tub's Hill Station and Riverhead, J. P. M. BRENAN.

532/1. LINARIA VULGARIS Mill. 41, Glamorgan; Aberthaw, a semipeloric form, many plants having flowers with two spurs, Miss E. VACHELL. 45, Pembroke; a tall broad-leaved form near Strumble Head, A. E. WADE, B.E.C. Excursion.

†532/2. LINARIA PURPUREA Mill. 36, Hereford; bank of R. Wye above Hereford, F. M. DAY.

532/3×1. LINARIA REPENS (L.) Mill. × VULGARIS Mill. 22, Berks.; South Hinksey, 1924, A. E. ELLIS.

532/7. LINARIA MINOR (L.) Desf. 23, Oxon.; growing profusely as a weed of cultivation, University Museum, Oxford, J. N. MILLS.

532/24. LINARIA SPURIA (L.) Mill. 2, E. Cornwall; garden weed, Efford Down, Bude, A. L. STILL.

*†532/26. LINARIA CYMBALARIA (L.) Mill. 94, Banff; Colleonard, near Banff, Miss M. McC. WEBSTER.

534/2. ANTIRRHINUM ORONTIUM L. 9, Dorset; East Creech, Miss L. ABELL.

†535/1. SCROPHULARIA VERNALIS L. 17, Surrey; garden weed, Epsom College, 1934 (" increasing," 1937), A. E. ELLIS.

535/3. SCROPHULARIA UMBROSA Dum. 28, W. Norfolk; by R. Wissey between Didlington and Hillborough, 1937, A. E. ELLIS. 69, Westmorland; banks of the Eden at Appleby, 1938, A. H. G. ALSTON and N. Y. SANDWITH. There is a previous record, " by the Eden at Temple Sowerby," Rev. H. H. HARVEY in *B.E.C. 1924 Rep.*, 586 (1925), which has been overlooked, N.Y.S.

†535/7. SCROPHULARIA SCOPOLII Hoppe ex Pers. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

†537/2. MIMULUS MOSCHATUS Dougl. 14, E. Sussex; Heathfield, D. MCCLINTOCK.

*539/1. LIMOSELLA AQUATICA L. 33, E. Gloster; bank of R. Severn above Lower Lode Hotel, Forthampton, F. M. DAY.

543/18c. VERONICA PERSICA Poir. var. KOCHIANA Godr. 16, W. Kent; cultivated ground, Lower Halling, J. P. M. BRENAN.

†543/22. VERONICA LONGIFOLIA L. 61, S.E. Yorks.; rubbish heap, Hessle, A. K. WILSON.

†543/39(2). **Veronica Lewisii** Armstrong in *Trans. N. Z. Inst.*, xiii, 357 (1881). Native of New Zealand. 1a, Scillies; near Old Town, St Mary's. (Lousley, 1939 C).

545. EUPHRASIA L. Determined by H. W. PUGSLEY. Further new vice-comital records are given by Pugsley (1940 A).

545/5d. EUPHRASIA NEMOROSA (Pers.) Löhr. var. COLLINA Pugsl. 61, S.E. Yorks.; Newbald Springs, A. K. WILSON. 109, Caithness; Dunnet Links, E. C. WALLACE.

545/9b. EUPHRASIA CURTA (Fr.) Wettstein var. GLABRESCENS Wettst. 3, S. Devon; Brixham, T. STEPHENSON.

545/15. EUPHRASIA MICRANTHA Reichb. 45, Pembroke; Carn Ingli, Newport, 1927; 96, Easterness; Newtonmore, 1933, A. E. ELLIS.

†546/4. BARTSIA VISCOSA L. *23, Oxon.; by canal near Tackley, K. E. EVETTS. *33, East Gloucester; Cheltenham, on a recently seeded playing ground, Miss MIDDLETON (1941: *Proc. Cotteswold Nat. F.C.*, 1940, *27*, 112).

549/4. MELAMPYRUM PRATENSE L. subsp. VULGATUM (Pers.) Beauverd, var. VULGATUM (Pers.) Beauverd subvar. DEVONIENSE Beauverd. 3, S. Devon; Hennoch, Chudleigh Knighton, T. STEPHENSON, det. C. E. BRITTON.

550/3. OROBANCHE RUBRA Sm. H. 35, N. Donegal; Ards Head, Sheep Haven, W. A. SLEDGE.

550/10. OROBANCHE MINOR Sm. 14, E. Sussex; Hassocks 1931, Newhaven 1930-36; see *Flora of Sussex* for remarks on this species in the county, L. A. W. BURDER.

552/2. UTRICULARIA NEGLECTA Lehm. 108, W. Sutherland; near Little Assynt, non-flowering, but probably this, P. M. HALL.

552/3. UTRICULARIA INTERMEDIA Hayne. H. 16, West Galway; near Clifden, W. A. SLEDGE.

552/5. UTRICULARIA MINOR L. 108, W. Sutherland; flowering in a lochan near Scourie, P. M. HALL and E. C. WALLACE. H. 16, West Galway; Kylemore, W. A. SLEDGE.

553/2. PINGUICULA VULGARIS L. 4, N. Devon; Clawton, 1940, H. H. HARVEY.

558. Mentha L. determined by A. L. Still.

558/1×4. ×Mentha cordifolia Opiz. 3, S. Devon; Abbotskerswell, Lustleigh, T. Stephenson.

558/2. Mentha longifolia (L.) Huds. 2, E. Cornwall; Crackington Haven, A. L. Still. 45, Pembroke; Tenby, F. L. Rees, comm. Dept. Bot., Nat. Mus. Wales.

558/6. Mentha piperita L. 39, Staffs.; Weston on Trent, G. J. V. Bemrose (not seen by A. L. Still).

558/6d. ×Mentha piperita L. var. subcordata Fraser. 36, Hereford; Evendine Corner, Colwall: 37, Worcs.; Castlemorton Common, F. M. Day.

558/7c. Mentha aquatica L. var. major Sole. 36, Hereford; Southend, Mathon: 37, Worcs.; Hanley Swan, F. M. Day.

558/9. ×Mentha verticillata L. 29, Cambs.; Wicken Fen, F. M. Day.

558/9e. ×Mentha verticillata L. var. ovalifolia H. Braun. 3, S. Devon; Batworthy, North Bovey, T. Stephenson.

558/10. Mentha gentilis L. var. resinosa (Opiz.) Briq. 3, S. Devon; near Hisley, Lustleigh, F. M. Day, G. T. Fraser and T. Stephenson.

558/13d. Mentha arvensis L. var. agrestis (Sole) Smith. 29, Cambs.; Balsham, F. M. Day. " This may be dwarfed by poor conditions. The larger piece suggests that if growing strongly it might get to *agrestis* Sole."—A. L. Still.

558/13f. Mentha arvensis L. var. praecox (Sole) Smith. 29, Cambs.; Waterbeach: 36, Hereford; White House Farm, Cradley, F. M. Day. 29—" This would come under var. *praecox* Sole but is too hairy for Fraser's conception of the variety."—A. L. Still.

558/13g. Mentha arvensis L. var. Allionii (Bor.) Briq. 3, S. Devon; Lustleigh, F. M. Day.

558/13m. Mentha arvensis L. var. brevidens Fraser. 29, Cambs.; Cottenham, F. M. Day. " The nearest I can think of—var. *brevidens*, not too typical."—A. L. Still.

561/4b. Thymus Serpyllum L. (sensu stricto) var. ericoides W. & G. S. Jersey; St Peter's golf links, 1938, P. Senay, jun., comm. P. Senay.

561/4f. THYMUS SERPYLLUM L. (sensu stricto) var. **Linneanus** G. & G. S. Jersey; St Peter's golf links (1938?), P. SENAY, jun., comm. P. SENAY.

561/10. THYMUS NEGLECTUS Ronn. 37, Worcs.; north of Martley, 1853, ex Herb. J. Fraser, comm. DEPT. BOT., NAT. MUS. WALES.

†566/5. SALVIA GLUTINOSA L. 6, N. Somerset; wood, Claverton, 1938, A. E. WHITE, comm. DEPT. BOT., NAT. MUS. WALES.

569/1. NEPETA CATARIA L. 11, S. Hants.; still flourishing between Breamore Wood and Mizaze as recorded by Townsend in 1879, Mrs ASHBY. †11, S. Hants.; Portchester, in a market-garden field with wool-aliens: probably alien in this locality though a native of the district, P. M. HALL and R. C. L. BURGES.

*†573/2. PRUNELLA LACINIATA L. 32 Northants; near Collyweston Great Wood, with *P. vulgaris* and hybrids, S. A. TAYLOR.

574/1. MELITTIS MELISSOPHYLLUM L. 11, S. Hants.; several patches in lane near Breamore Wood, Mrs ASHBY.

577/3. STACHYS SYLVATICA L. 23, Oxon.; teratological form with long pedicels, viridescent malformed corolla, ovary abortive or proliferating into a further flower above the first, foliage normal; marshy field on clay, Horsepath, N. E. G. CRUTTWELL.

578/1. GALEOPSIS SPECIOSA Mill. 39, Staffs.; cornfield between Norton Green and Knipersley Pool, E. S. EDEES; New School, Newcastle-under-Lyme, G. J. V. BEMROSE. *44, Carmarthen; near Trimsavan, 1940, J. F. JONES, comm. DEPT. BOT., NAT. MUS. WALES. 50, Denbigh; roadside on Chirk mountains, between Llangollen and Chirk, A. GAUNT, comm. DEPT. BOT., NAT. MUS. WALES.

581/10. LAMIUM GALEOBDOLON (L.) Crantz. 47, Montgomery; near Berriew, Miss S. HAINES.

†588/1. PLANTAGO INDICA L. 15, E. Kent; waste ground by roadside N. of Copt Point, Folkestone, J. P. M. BRENAN. 25, E. Suffolk; sandy ground, Thorpeness, F. DRUCE.

†596/4. AMARANTHUS CHLOROSTACHYS (Willd.) Thell. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†596/6b. AMARANTHUS RETROFLEXUS L. var. DELILEI (Richt. & Lor.) Thell. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

†596/10b. AMARANTHUS DINTERI Schinz var. UNCINATUS Thell. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. N. Y. SANDWITH and J. P. M. BRENAN.

†596/11. AMARANTHUS ANGUSTIFOLIUS Lam. (sensu stricto) = A. SYLVESTRIS Desf. (A. ANGUSTIFOLIUS ssp. SILVESTER (Desf.) Thell. 21, Middlesex; waste ground, Whetstone, 1940, N. E. G. CRUTTWELL, det. J. P. M. BRENAN.

†596(2). **Digera** Forsk., *Fl. Aegypt. arab.*, 65 (1775).

†596(2)/1. **Digera alternifolia** (L.) Aschers. in *Schweinf. Beitr. Fl. Aethiop.*, 180 (1867). *Achyranthes alternifolia* L., *Mant.*, i, 50 (1767). *Digera arvensis* Forsk., *l.c.* Alien, Orient, Tropical Asia, North, West, and East Africa. 18, S. Essex; waste ground, Dagenham, October 1939, N. Y. SANDWITH and J. P. M. BRENAN. (It has occurred at Mannheim.)

†600/1(2). **Chenopodium macrospermum** Hook. f., *Fl. Antarct.*, ii, 341 (1847), subsp. **halophilum** (Phil.) Aellen, f. **subviride** Thellung et Aellen in Fedde, *Rep. Sp. Nov.*, xxvi, 43 (1929). *C. halophilum* Phil. in *Anal. Univ. Santiago*, xviii, 67 (1861). Alien, Temperate S. America. 34, W. Gloucester; Avonmouth Docks, November 1938, C. I. SANDWITH, det. PAUL AELLEN. The species and subspecies were first recorded as new for Britain by Aellen in 1930, and the record (from Tweedside) is repeated in *B.E.C. 1931 Rep.*, p. 578 (1932). The form is now recorded as British. A wool-alien, collected on several occasions in Europe.

600/4. CHENOPODIUM HYBRIDUM L. 30, Beds.; Ampthill, 1924, A. E. ELLIS. 53, S. Lincs.; near Ancaster, S. A. TAYLOR.

600/6. CHENOPODIUM MURALE L. 3, S. Devon; High Week, on waste ground near Bradley Lane, Newton Abbot, Rev. A. CRAWSHAW, G. T. FRASER and T. STEPHENSON.

†600/8(2). CHENOPODIUM RETICULATUM Aell. 16, W. Kent; Green Street Green, J. P. M. BRENAN.

†600/11. **Chenopodium pratericola** Rydb., in Bull. Torr. Bot. Club, xxxix, 310 (1912), var. **Thellungianum** Aell., in Ostenia, 100 (1933) (=*C. leptophyllum* auct. *non* Nutt.). 16, W. Kent; waste ground, Green Street Green, J. P. M. BRENAN.

†600/11. " CHENOPODIUM LEPTOPHYLLUM " auct. 61, S.E. Yorks.; rubbish heaps, Springhead, A. K. WILSON.

600/13. CHENOPODIUM GLAUCUM L. *†23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN. *56, Notts.; side of lane, Misson, August 1918, C. I. and N. Y. SANDWITH.

†600/21. CHENOPODIUM HIRCINUM Schrad. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†603/1. MONOLEPIS NUTTALLIANA (R. & S.) Greene. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES.

†606/3e. ATRIPLEX PATULA L. var. BRACTEATA Westerlund. 16, W. Kent; waste ground, High Brooms, J. P. M. BRENAN.

†606/10. ATRIPLEX HORTENSIS L. 61, S.E. Yorks.; Springhead, A. K. WILSON, det. at KEW.

†612/3. SUAEDA ALTISSIMA (L.) Pall. 23, Oxon.; waste ground, Port Meadow, Oxford, J. P. M. BRENAN.

†613/4. **Salsola collina** Pall., *Illustr.*, 34, t. 26 (1803). Alien, S. Russia and North Temperate Asia. 18, S, Essex; waste ground, Dagenham, Oct. 1939, J. P. M. BRENAN and N. Y. SANDWITH. The specimens probably represent the typical form, coming under f. *glabra* (Moq.-Tand.) Iljin in Komarov, *Flora U.R.S.S.*, vi, 215 (1936). The latter epithet, although attributed to C. A. Meyer, appears to have been first validly published as *S. collina* var. *glabra* by Moquin-Tandon, *Chenopod. Mon. Enum.*, 147 (1840). *S. collina* has occurred as an adventive in Central Europe at Mannheim.—J. P. M. BRENAN and N. Y. SANDWITH.

615/2. POLYGONUM CONVOLVULUS L. var. SUBALATUM Lej. & Court. 37, Worcester; sewage farm, Malvern, 1940, F. M. DAY.

*615/4. POLYGONUM VIVIPARUM L. 103, Mid Ebudes; Coire nam Fuaran, Ben More, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

*615/10. POLYGONUM MITE Schrank. 7, N. Wilts.; bank of the Avon near Avoncliff, 1940, N. Y. SANDWITH.

615/11. POLYGONUM MINUS Huds. 5, S. Somerset; Stogumber, 1938, A. E. ELLIS.

*615/15. POLYGONUM AEQUALE Lindman. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 3).

†615/19. POLYGONUM PATULUM MB. 15, E. Kent; waste slope by the cliffs N. of Copt Point, Folkestone, J. P. M. BRENAN.

*†615/28. POLYGONUM AMPLEXICAULE D. Don. 48, Merioneth; near Pennal, garden escape, 1940, J. A. WEBB, comm. DEPT. BOT., NAT. MUS. WALES.

†615/33. POLYGONUM SACHALINENSE Schmidt. 45, Pembroke; Amroth, 1938, F. LILIAN REES, comm. DEPT. BOT., NAT. MUS. WALES.

618/6×8. Rumex obtusifolius L. × nemorosus Schrad. 45, Pembroke; Haroldston St Issells, 1930, A. E. Ellis.

618/7. Rumex sanguineus L. 45, Pembroke; Haroldston St Issells and Fern Hill, Haverfordwest, 1930, A. E. Ellis.

618/9×13. Rumex conglomeratus Murr. × maritimus L. 62, N.E. Yorks.; Dalton, C. M. Rob and W. A. Sledge.

618/11. Rumex pulcher L. ssp. eu-pulcher Rech. fil. 11, S. Hants.; The Spain, Petersfield: 13, W. Sussex; field one mile S.W. of Chichester: E. C. Wallace.

618/12. Rumex palustris Sm. 28, W. Norfolk; Weeting, 1931, A. E. Ellis.

618/13. Rumex maritimus L. 32, Northants; Marston Trussel, 1921, A. E. Ellis. 62, N.E. Yorks.; Dalton near Thirsk: 65, N.W. Yorks.; Sutton Howgrove, C. M. Rob, comm. W. A. Sledge.

†618/19. Rumex salicifolius Weinm. 41, Glamorgan; rubbish heap, Cardiff E., R. L. Smith and J. E. Woodhead.

626/1. Viscum album L. 14, E. Sussex; on *Tilia* at Rowfant, E. C. Wallace. 17, Surrey; on *Sorbus Aria*, Boxhill, 1936, A. E. Ellis.

627/1. Thesium humifusum DC. 23, Oxon.; near Chadlington, Lady Roche.

†628/16. Euphorbia Lathyris L. *49, Caernarvon; Llanfairfechan, 1933, and Abersoch, 1940, E. Talfourd Jones, comm. Dept. Bot., Nat. Mus. Wales. *55, Leics.; waste ground, Little Bowden, 1922, A. E. Ellis.

633/4. Ulmus Plotii Druce. The vice-comital distribution of this tree in Britain is given by Melville (1940) as:—7, 22-24, 29, 31-36, 38-40, 53-56, 63.

637/1b. Urtica dioica L. var. angustifolia Wimm. & Grab. 37, Worcs.; Drake's Broughton, F. M. Day.

642/3. Betula nana L. 88, Mid Perth; Glen Lyon, north side, hills above Meggernie Castle, W. A. Sledge. [Recorded from here in Lightfoot's *Flora Scotica*, *2*, 575, E. C. Wallace.]

*†651/3. Populus nigra L. var. genuina Wesm. 7, N. Wiltshire; Wanborough, J. D. Grose (1939: *Wilts. Arch. and N. H. Mag.*, *48*, 412).

*651/3b. Populus nigra L. var. betulifolia (Pursh) Torrey. 14, E. Sussex; Sheffield Park, C. Norman and A. B. Jackson (*J.B.*, *77*, 321).

653/1. CERATOPHYLLUM SUBMERSUM L. 14, E. Sussex; fruiting freely in dyke near Rickney, Pevensey Level: 15, E. Kent; dyke near Snargate: E. C. WALLACE. 36, Hereford; R. Wye, Breinton, F. M. DAY. (Specimens from a pond at Tyberton were distributed in 1938. —ED.) *37, Worcs.; pond at Castle Morton, coll. A. J. CROSFIELD and R. F. TOWNDROW, in Herb. C. E. Salmon; for reference see C. I. Sandwith in "The Hornworts and their occurrence in Britain," in *Proc. Bristol Nat. Soc.*, 45, vol. vi, pt. iv, p. 308 (1926), where an inland gathering from Leicestershire is also mentioned (Horwood, *Fl. Leics.*, 514, gives four records), N. Y. SANDWITH: pond near The Farmer's Arms, Birt Street, Birtsnorton, F. M. DAY.

654/1. HYDROCHARIS MORSUS-RANAE L. 44, Carmarthen; disused canal, near Pinged Halt, 1940, J. F. JONES, comm. DEPT. BOT., NAT. MUS. WALES.

*†657/1. VALLISNERIA SPIRALIS L. 34, W. Gloucester; in the Berkeley Canal at Purton and Shepherd's Patch, C. I. SANDWITH and B. WELCH. The only other naturalised British specimens seen are from Reddish, Lancs.: for its occurrence in a brickpond in Worcestershire, see Amphlett and Rea, *The Botany of Worcestershire*, p. 339 (1909), N.Y.S. 63, S.W. Yorks.; canal, Salterhebble, Halifax, W. A. SLEDGE.

659/1. HAMMARBYA PALUDOSA (L.) O. Kuntze. 3, S. Devon; in a bog, Widecombe, 1939, L. A. HARVEY, det. T. STEPHENSON.

662/1. NEOTTIA NIDUS-AVIS (L.) Rich. 23, Oxon.; near Cuddesdon, 1940, N. E. G. CRUTTWELL.

663/1. LISTERA OVATA (L.) R. Br. 108, W. Sutherland; Melvich, sand dunes near sea level, P. M. HALL and E. C. WALLACE.

663/2. LISTERA CORDATA (L.) R. Br. 97, Westerness; Luinga Mhor, Arisaig, J. S. WILKINSON.

664/1. SPIRANTHES AESTIVALIS (Lam.) Rich. Observations of this plant in the New Forest show that it is being gathered each year as soon as it is in bloom. The results of this reprehensible practice are obvious by its diminishing numbers.

665/1. GOODYERA REPENS (L.) R. Br. 97, Westerness; on large mossy boulders, Loch nan Ceall, Arisaig, J. S. WILKINSON. 105, West Ross; two or three plants on heathy ground close to the shore at Reraig, 1938, indigenous *Pinus* on slopes above; the first recent record, J. A. WHELLAN, comm. P. M. HALL.

668/3. EPIPACTIS LEPTOCHILA (Godf.) Godf. 12, N. Hants.; Colemore, near Petersfield, Miss BRADFIELD and Miss NEWCOMBE, comm. P. M. HALL. [This is only the second locality for v.-c. 12, the other being Selborne Hanger: the Colemore locality is in some clay-pits among dense underwood beneath oaks: there were about a dozen plants, mostly dwarf and spindly.—P.M.H.]

*668/3(3). Epipactis vectensis (T. & T. A. Steph.) Brooke & Rose. 33, East Gloucester; beechwood near Birdlip, Charles Thomas (1941: *Proc. Cotteswold Nat. F.C.*, 1940, *27*, 111).

669/4. Orchis ustulata L. 26, W. Suffolk; Risby Poors Heath, sparingly, J. E. Lousley and E. C. Wallace.

669/6. Orchis pardalina Pugsl. 39, Staffs.; Stanton, 1938, E. S. Edees (*Journ. Bot.*, *78*, 269).

669/7. Orchis latifolia L. 17, Surrey; Chertsey Meads, H. W. Kew. 61, S.E. Yorks.; Newbald Springs, A. K. Wilson.

669/7×9. Orchis latifolia L. × purpurella T. & T. A. Steph. 65, N.W. Yorks.; Semmerwater, W. A. Sledge.

*669/9(2). Orchis occidentalis (Pugsl.) Wilmott. 108, W. Sutherland; Portskerra, Melvich, P. M. Hall and E. C. Wallace.

669/11. Orchis Fuchsii Druce. 61, S.E. Yorks.; Newbald Springs, A. K. Wilson.

669/11×7. Orchis Fuchsii Druce × latifolia L. 61, S.E. Yorks.; Newbald Springs, A. K. Wilson.

*669/17. Anacamptis pyramidalis (L.) Rich. 110, Outer Hebrides; Barra, 1936, C. M. Cant (E. V. Watson in *Journ. Bot.*, *77*, 7), Fuday, Heslop Harrison (1939: 4).

*669/18. Himantoglossum hircinum (L.) Koch. 62, N.E. Yorks.; near Pickering, one plant, Mr Crosland, comm. W. A. Sledge.

671/1. Aceras anthropophora (L.) R. Br. 6, N. Somerset; near Bath, 1933, A. E. White (C. I. Sandwith, *Bristol Botany in 1939*). *53, S. Lincolnshire; roadside at Ancaster near Grantham, 1940, E. E. Orchard, comm. N. Polunin.

673/1. Herminium Monorchis (L.) Br. 6, N. Somerset; Bath, 1938, A. E. White, (C. I. Sandwith, *Bristol Botany in 1939*).

674/1. Gymnadenia conopsea (L.) R. Br. 110, Outer Hebrides; Fuday, Heslop Harrison (1939: 4).

674/1×669/11. Gymnadenia conopsea (L.) R. Br. × Orchis Fuchsii Druce. H. 35, N. Donegal; by Lough Mullardergh, W. A. Sledge.

674/3. LEUCORCHIS ALBIDA (L.) Meyer. 108, W. Sutherland; Meall Meadhonach, Durness, 1938, D. McCLINTOCK. *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

†680/1. SISYRINCHIUM ANGUSTIFOLIUM Mill. 11, S. Hants.; roadside, Brockenhurst, H. SYMES, comm. W. A. PAYN. 41, Glamorgan; railway bank near Radyr, first seen about 1929, H. HUSBANDS, comm. Miss E. VACHELL.

691/2. POLYGONATUM MULTIFLORUM (L.) All. 16, W. Kent; by stream, Ashurst, 1940, The Hon. Mrs NIGHTINGALE, comm. A. H. WOLLEY-DOD.

694/1. CONVALLARIA MAJALIS L. *43, Radnor; Aberedw, J. WILLIAMS, comm. DEPT. BOT., NAT. MUS. WALES. 77, Lanark; Hamilton, 1905, H. K. WALLACE, comm. A. E. ELLIS.

702/2. ALLIUM BABINGTONII Borrer. 2, E. Cornwall; Boscastle Harbour, A. L. STILL.

702/4b. ALLIUM VINEALE L. var. BULBIFERUM Syme. 3, S. Devon; near Coombe Cellars, Haccombe, G. T. FRASER.

†702/7. ALLIUM TRIQUETRUM L. 41, Glamorgan; Newton, Porthcawl, Mrs BRUCE, comm. Miss E. VACHELL.

702/9. ALLIUM OLERACEUM L. 37, Worcs.; in great quantity at the side of a lane near The Bye Way Inn, Alfrick, F. M. DAY.

*†708/2. LILIUM PYRENAICUM Gouan. 44, Carmarthen; in abundance in a wooded dell, about 6 miles from the sea, between St Clears and Carmarthen, 1940, B. PARDON, comm. DEPT. BOT., NAT. MUS. WALES.

†710/1. TULIPA SYLVESTRIS L. 20, Herts.; several patches in a plantation near Sawbridgeworth, looking wild, rarely flowering, F. DRUCE.

711/1. GAGEA LUTEA (L.) Ker-Gawler. 38, Warwick; banks of R. Cole, Marston Green, W. H. HARDAKER.

715/1. TOFIELDIA BOREALIS (Wahl.) Wahl. 108, W. Sutherland; near Durness at 140 ft. above sea level, E. C. WALLACE and P. M. HALL. [*Comital Flora* gives as the lowest elevation for this species in Britain "700 ft. at Inchnadamph."—P.M.H.]

716/1. PARIS QUADRIFOLIA L. 61, S.E. Yorks.; A. K. WILSON.

718/4×5. ×JUNCUS DIFFUSUS Hoppe. 37, Worcester; Old Hills, Powick, 1940, F. M. DAY.

718/14. JUNCUS COMPRESSUS Jacq. 37, Worcester; bank of Severn, Upton, 1940, F. M. DAY.

*719/8. LUZULA SPICATA (L.) DC. 103, Mid Ebudes; Coire nam Fuaran, Ben More, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

721/2. TYPHA ANGUSTIFOLIA L. 6, N. Somerset; marshy slack in sand dunes, Berrow, 1940, J. P. M. BRENAN and N. E. G. CRUTTWELL.

722/1. SPARGANIUM NEGLECTUM Beeby. 36, Hereford; Coddington, 1940; 37, Worcester; Defford Common, 1940, F. M. DAY. *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

722/2. SPARGANIUM RAMOSUM Huds. var. MICROCARPUM Neuman. 36, Hereford; bank of river Lugg, Lugwardine, 1940, F. M. DAY.

†724/1. ACORUS CALAMUS L. 39, Staffs.; Betley Mere, G. J. V. BEMROSE.

727/3. LEMNA TRISULCA L. 3, S. Devon; Ottery St Mary, Rev. W. K. MARTIN and G. T. FRASER.

728/1. WOLFFIA ARRHIZA (L.) Wimm. 15, E. Kent; ditches near Stone and at Snargate, Romney Marsh, E. C. WALLACE.

729/1b. ALISMA LANCEOLATUM With. 7, N. Wilts.; by Kennet and Avon canal at Semington; 8, S. Wilts.; by same canal at Avoncliff, 1940, N. Y. SANDWITH. It occurs along the same canal in 6, N. Somerset, between Bath and Bathampton.

735/1. TRIGLOCHIN MARITIMUM L. 109, Caithness; shore of Loch Winless, far inland, E. C. WALLACE.

737/3. POTAMOGETON NODOSUS Poir. *7 and *8, N. and S. Wilts.; traced up the Avon to Limpley Stoke, Avoncliffe, Bradford-on-Avon and Staverton, A. H. G. ALSTON, C. I. and N. Y. SANDWITH. *34, W. Glos.; river Avon, Bristol (Dandy and Taylor, 1939: 62).

737/4. POTAMOGETON COLORATUS Hornem. *51, Flint (Dandy and Taylor, 1939: 253). H. 16, West Galway; plentiful in all the loughs of the Slyne Head promontory, W. A. SLEDGE.

737/5. POTAMOGETON ALPINUS Balb. 56, Notts.; *91, Kincardine; *98, Argyll; *105, West Ross; (Dandy and Taylor, 1939: 253).

737/8. ×POTAMOGETON SPARGANIFOLIUS Laestad. ex Fr. 31, Hunts.; *92, S. Aberdeen; *96, Easterness (Dandy and Taylor, 1939: 254).

737/9. POTAMOGETON GRAMINEUS L. H. 35, N. Donegal; Lough Kinny, W. A. SLEDGE.

737/11. ×POTAMOGETON NITENS Weber. 56, Notts.; *63, S.W. York.; *64, M.W. York.; *74, Wigtown; *87, West Perth; *99, Dumbarton (Dandy and Taylor, 1939: 254). H. 16, West Galway; plentiful in the loughs of the Slyne Head promontory, W. A. SLEDGE.

737/12. ×POTAMOGETON ZIZII Koch ex Roth. 27, E. Norfolk; *54, N. Lincoln; *65, N.W. York; *100, Clyde Isles; *105, W. Ross; *111, Orkney; *H. 36, Tyrone (Dandy and Taylor, 1939: 256). *110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

737/13. POTAMOGETON LUCENS L. 36, Hereford; R. Wye above Hereford, F. M. DAY. Bracket in *C.F.*, 110, Outer Hebrides (Dandy and Taylor, 1940: 140).

737/14. ×POTAMOGETON DECIPIENS Nolte ex Koch. 6, N. Somerset; Kennet and Avon Canal at Bathampton, 1940, A. H. G. ALSTON, C. I. and N. Y. SANDWITH. *8, S. Wilts. (Dandy and Taylor, 1939: 343). 15, E. Kent; *22, Berks. (Dandy and Taylor, 1939, 255). *34, W. Gloucester; still in the Avon at Crews Hole and between Conham and Hanham Ferries, A. H. G. ALSTON, C. I. and N. Y. SANDWITH. [Add to *C.F.* and *Top. Bot.* though recorded in White, *Fl. Bristol*, 609.—ED.] *89, E. Perth (Dandy and Taylor, 1939: 255).

737/15. POTAMOGETON PRAELONGUS Wulf. *105, W. Ross (Dandy and Taylor, 1939: 256). H. 16, West Galway; Doonloughan, Slyne Head, W. A. SLEDGE. *H. 37, Armagh (Dandy and Taylor, 1939: 256).

737/16. POTAMOGETON PERFOLIATUS L. *78, Peebles; *105, W. Ross (Dandy and Taylor, 1939: 256).

737/18. POTAMOGETON COMPRESSUS L. *20, Herts.; *47, Montgomery (Dandy and Taylor, 1939: 257). 55, Leicester; canal, Foxton, 1922, A. E. ELLIS.

*737/19. POTAMOGETON ACUTIFOLIUS Link. 11, S. Hants. (Dandy and Taylor, 1939: 257).

737/20. POTAMOGETON OBTUSIFOLIUS Mert. & Koch. 76, Renfrew; Knapps Loch, Kilmacolm, R. MACKECHNIE.

737/20. POTAMOGETON OBTUSIFOLIUS Mert. & Koch. *11, S. Hants; *65, N.W. Yorks.; *83, Edinburgh; *99, Dumbarton; *111, Orkney (Dandy and Taylor, 1939: 257).

737/22. POTAMOGETON FRIESII Rupr. *83, Edinburgh; *84, Linlithgow (Dandy and Taylor, 1939: 258).

737/23. POTAMOGETON BERCHTOLDII Fieb. British records and available material have been revised by Dandy and Taylor (1940 B), who give the distribution at present known as:—1-30, 32-75, 77, 79-93, 95-103, 105, 106, 109-112. H. 16, West Galway; Renvyle, W. A. SLEDGE.

737/25. POTAMOGETON PUSILLUS L. British records and available material have been revised by Dandy and Taylor (1940 A), who give the distribution at present known as:—1, 2, 4, 6-18, 20-25, 27-35, 37-41, 46, 48, 49, 52-57, 59-61, 63-65, 68-70, 73, 74, 77, 80, 83, 85, 86, 88-90, 93, 95, 96, 102, 109, 111, 112. Add 58 (Dandy and Taylor, 1940) and 110 (Dandy and Taylor, 1940 C) to above. *H. 35, N. Donegal; Magheradrumman, Fanad Head, W. A. SLEDGE.

*737/27. POTAMOGETON TRICHOIDES Cham. & Schlecht. Add to *C.F.* (see revised distribution in *B.E.C. 1938 Rep.*, 62, 1939), 2, 7, 8, 20, 22, 24, 35, 53, 63, 99 (Dandy and Taylor, 1939: 258).

*737/28. POTAMOGETON PECTINATUS L. 70, Cumberland (Dandy and Taylor, 1939: 259).

737/30. POTAMOGETON FILIFORMIS Pers. H. 35, N. Donegal; plentiful in Lough Kinny, W. A. SLEDGE. *H. 39, Antrim (Dandy and Taylor, 1939: 259).

737/31. POTAMOGETON DENSUS L. *87, W. Perth; *106, E. Ross (Dandy and Taylor, 1939: 257).

740/1. ZOSTERA MARINA L. 97, Westerness; seashore, Morar, 1938, E. C. WALLACE.

740/1(2). ZOSTERA HORNEMANNIANA Tutin. 44, Carmarthen; Ferryside, L. HUGH MILNE, det. T. G. TUTIN (*J.B.*, 77, 96).

741/2. NAIAS FLEXILIS (Willd.) Rostk. & Schmidt. H. 16, West Galway; with *Hydrilla* but only a single piece seen: H. 35, N. Donegal; plentiful, The Rosses, Lough Mullagdergh, W. A. SLEDGE.

745/2. HELEOCHARIS UNIGLUMIS (Link) Schultes. 25, E. Suffolk; Aldeburgh Marshes, F. DRUCE.

746/2. SCIRPUS MARITIMUS L. 33, E. Gloster; R. Severn, Forthampton, F. M. DAY.

746/12. SCIRPUS CERNUUS Vahl. 27, E. Norfolk; Bryant's Heath, Felmingham, 1938, A. E. ELLIS.

*746/14. SCIRPUS COMPRESSUS (L.) Pers. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

746/15. SCIRPUS RUFUS (Huds.) Schrad. 45, Pembrokeshire; Newport, 1933, E. H. CHATER, comm. A. J. WILMOTT. 69, N. Lancs.; Sunderland Point near Heysham, W. H. HARDAKER.

747/3. ERIOPHORUM GRACILE Roth. 9, Dorset; bog between Wareham and Corfe Castle, J. W. HAINES. [An interesting record from a new locality, the second in Dorset, not the well-known locality near Studland.—ED.]

*748/1. RYNCHOSPORA FUSCA (L.) Ait. 105, W. Ross; bog by Loch Maree, Miss E. S. KERR, comm. A. H. WOLLEY-DOD.

*750/1. CLADIUM MARISCUS R. Br. 110, Outer Hebrides; Eriskay, Heslop Harrison (1939: 4).

753/1. CAREX PSEUDO-CYPERUS L. 39, Staffs.; Froghall, G. J. V. BEMROSE.

753/3. CAREX ACUTIFORMIS Ehrh. 36, Hereford; marshy coppice at Eaton Bishop, F. M. DAY.

*753/5. CAREX GRAHAMI Boott. 98, Argyll; Ben Douran, 1940, See *J.B.*, *78*, 270, E. C. WALLACE.

753/7. CAREX ROSTRATA Stokes. 39, Staffs.; Consall, G. J. V. BEMROSE.

753/9. CAREX HIRTA L. 2, E. Cornwall; a form with compound spikelets, Widemouth Bay, A. L. STILL.

753/9d. CAREX HIRTA L. forma SPINOSA Mort. 37, Worcs.; Naunton, Ripple, F. M. DAY.

753/11. CAREX SYLVATICA Huds. 39, Staffs.; Stanton, G. J. V. BEMROSE.

753/12. CAREX STRIGOSA Huds. 12, N. Hampshire; abundant in lane, Heather Row near Hook: 13, W. Sussex; abundant on site of Roman Road near Rowhook, E. C. WALLACE. 20, Herts.; damp mixed oakwood on clay, Radlett, 1938, N. E. G. CRUTTWELL.

753/13. CAREX HELODES Link. 2, E. Cornwall; coombe north of St Gennys: foot of hill near Trefronn, Week St Mary, A. L. STILL. *50, Denbigh; wood near Cwm Bach, Llanferris, 1940: *51, Flint; bog near the preceding, 1940, J. A. WHELLAN, comm. DEPT. BOT., NAT. MUS. WALES.

753/14. CAREX CAPILLARIS L. 64, M.W. Yorks.; still at Gordale Scar, where it was found by W. West in 1878 but it does not appear to have been seen there by any living botanist until refound in 1939 by G. A. Shaw.—W. A. SLEDGE. 108, W. Sutherland; sandhills at Melvich, marsh at Durness: 109, Caithness; Dunnet Links, all at near sea-level, P. M HALL and E. C. WALLACE.

753/17. Carex distans L. 12, N. Hampshire; marshy field near Mapledurwell; also near Sherfield on Loddon; E. C. Wallace. 108, W. Sutherland; shore at Keoldale, P. M. Hall and E. C. Wallace.

753/19. Carex Hostiana DC. 12, N. Hampshire; Mapledurwell and near Old Basing: 109, Caithness; shore of Loch Winless, E. C. Wallace.

753/20×22. Carex flava L. × viridula Michx. var. elatior (Anders.) Wilmott. 65, N.W. Yorks.; Semmerwater, W. A. Sledge.

753/22. Carex viridula Michx. H. 16, West Galway; Bunowen, Slyne Head, W. A. Sledge.

753/22d. Carex viridula Michx. var. elatior (Anders.) Wilmott. 65, N.W. Yorks.; Semmerwater, W. A. Sledge.

753/23. Carex extensa Good. 45, Pembroke; saltings at Newport. 1927, A. E. Ellis; 1933, E. H. Chater, comm. A. J. Wilmott. 69, N. Lancs.; Sunderland Point near Heysham, W. H. Hardaker.

753/38. Carex limosa L. 108, W. Sutherland; lower slopes of Beinn Ceannabeine, Durness, P. M. Hall and E. C. Wallace.

*753/39. Carex rariflora Sm. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4). A most surprising plant for the Western Isles, considering its habitat in eastern Scotland.—E. C. Wallace.

*753/42. Carex Halleri Gunn. 110, Outer Hebrides; N. Uist, W. A. Clark (1939: 5).

753/49×45. Carex Goodenowii Gay × Hudsonii Ar. Benn. 11, S. Hants.; water meadows near St Cross, Winchester, P. M. Hall, E. Nelmes and E. C. Wallace.

*753/57. Carex remota L. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

*753/57×59. ×Carex axillaris Good. 2, E. Cornwall; by canal at foot of Marhamchurch Plane: dry bed of canal above Marhamchurch (the form with simple spikelets, var. *remotiformis* Rouy); A. L. Still.

753/59(2). Carex vulpina L. 16, W. Kent; damp ground among bushes by the River Medway near Hartlake Bridge, N.E. of Tudeley Hale, J. P. M. Brenan.

753/60. Carex spicata Huds. 37, Worcs.; near R. Severn, Powick, F. M. Day.

753/61. Carex Pairaei F. Schultz. 2, E. Cornwall; Tintagel, A. L. Still. *8, S. Wilts.; Chute, 1940, J. D. Grose. *98, Argyll, roadside bank, Ledaig, near Connel Ferry, 1940, E. C. Wallace.

753/63. Carex paniculata L. 109, Caithness; shore of Loch Winless, P. M. Hall and E. C. Wallace.

753/65. Carex diandra Schrank. 61, S.E. Yorks.; Kelleythorpe Marsh, Driffield, July 1939. Bracketed as extinct or dubious in this v.-c. in *C.F.*, but it has been known here for 40 years, W. A. Sledge. (Remove brackets in *C.F.*—Ed.) 109, Caithness; shore of Loch Winless in some abundance, P. M. Hall and E. C. Wallace. (Add to *C.F.*, not N.C.R.—see *Top. Bot.*—E. C. Wallace.

753/66. Carex disticha Huds. 12, N. Hampshire; about Andwell, Mapledurwell and Old Basing, E. C. Wallace.

753/68. Carex divisa Huds. 61, S.E. Yorks.; Easington, 1938, A. K. Wilson.

*753/71. Carex rupestris All. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

753/75. Carex dioica L. 12, N. Hampshire; marshy field at Mapledurwell, 1939, E. C. Wallace. Recorded from here in Townsend's *Flora of Hampshire* for 1860 but no reference to it can be found during the interval.—E.C.W.

†753/77. Carex vulpinoidea Michx. 61, S.E. Yorks.; Broomfleet Delphs, A. K. Wilson.

†754/8d. Echinochloa Crus-galli (L.) Beauv. var. aristata S. F. Gray. 11, S. Hants.; in a field of carrots, Heytesbury Farm, Fareham, 1938, P. M. Hall, det. C. E. Hubbard.

†756/1. Setaria italica (L.) Beauv. 61, S.E. Yorks.; rubbish heaps, Springhead, A. K. Wilson.

†757/1. Coix Lachryma-Jobi L. 23, Oxon.; Waste ground, Jackdaw Lane, Oxford, J. P. M. Brenan.

†758/3. Spartina Townsendii H. & J. Groves. *2, East Cornwall; Tamar saltings, Saltash, J. H. Adams. *37, Worcester; in shallow water of the Droitwich Canal, near Salwarpe, W. H. Hardaker. *48, Merioneth; Abertafol Sands, J. A. Webb, originally planted on the Cardiganshire side of the Dovey Estuary from whence it has spread, comm. Dept. Bot., Nat. Mus. Wales.

†765/6. Phalaris brachystachys Link. 16, W. Kent; Green Street Green, J. P. M. Brenan.

*770/2. ALOPECURUS ALPINUS Sm. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

*770/6. ALOPECURUS AEQUALIS Sobol. 56, Notts.; pond by the Haxey Gate Inn, Misterton, C. I. and N. Y. SANDWITH.

775/1. MILIUM EFFUSUM L. 2, E. Cornwall; Valency Valley, Boscastle, A. L. STILL.

*†778/1. MIBORA MINIMA (L.) Desv. 25, E. Suffolk; naturalised in nursery garden, Woodbridge, Mrs BULL, comm. A. H. WOLLEY-DOD. 67, S. Northumberland; referred to again by J.W.H.H. in *Vasc.*, *25*, No. 2, 69, where some plants under observation proved viviparous and apparently perennial (see *B.E.C. 1938 Rep.*, 64: 1939).

†780/8(2). **Agrostis pisidica** Boiss. in *Ann. Sci. Nat.*, ser. iv, ii, 255 (1854). *A. trichoclada* Griseb. var. *pisidica* (Boiss.) Boiss., *Fl. Orient.*, v, 516 (1882). 6, N. Somerset; Bristol, C. I. and N. Y. SANDWITH.

†782/1. POLYPOGON MONSPELIENSIS (L.) Desf. 3, S. Devon; High Week, waste ground near Bradley Lane, Newton Abbot, in quantity originating from Torbay Mills, a fodder concern, G. T. FRASER. 61, S.E. Yorks.; Brough, A. K. WILSON.

*791/3. DESCHAMPSIA SETACEA (Huds.) Richter. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

793/1c. TRISETUM FLAVESCENS (L). Beauv. var. VARIEGATUM (Mert. & Koch) Druce. 41, Glamorgan; coast near Barry, Miss E. VACHELL.

†794/6. AVENA STRIGOSA Schreb. 29, Cambs.; Southam: 37, Worcester; bank of river Teme, Cotheridge, 1940. F. M. DAY.

795/2. ARRHENATHERUM TUBEROSUM (Gilib.) Druce. 91, Kincardine; bank of Dee, Gateside, E. C. WALLACE.

†810/1. DIPLACHNE FUSCA (L.) Beauv. 11, S. Hants.; wool-alien, Portchester, P. M. HALL and R. C. L. BURGES, det. at KEW.

814/1. CATABROSA AQUATICA (L.) Beauv. 29, Cambs.; Grantchester Meadows, F. M. DAY.

822/1b. BRIZA MEDIA L. var. ALBIDA Lej. 41, Glamorgan; Lavernock, Miss E. VACHELL.

824/2b. POA PRATENSIS L. var. ANGUSTIFOLIA (L.) Mert. & Koch. 36, Hereford; Fox Hill, Bosbury, F. M. DAY.

*824/5. POA PALUSTRIS L. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

824/6b. POA TRIVIALIS L. var. GLABRA Döll. 32, Northants; Clack Hill near Market Harborough, 1922: 50, Denbigh; Glyndyfrdwy, 1921, A. E. ELLIS, det. C. E. HUBBARD.

†824/13b. POA BULBOSA L. var. VIVIPARA Koeler. 6, N. Somerset; waste ground, Bristol, May 1939, with the typical variety, C. I. SANDWITH and I. W. EVANS. 34, W. Gloucester; waste ground, Avonmouth Docks, May 1932, C. I. SANDWITH. New to the Bristol list.

825/2×3. GLYCERIA FLUITANS (L.) R. Br. × PLICATA Fr. 29, Cambs.; Upware, 1931, A. E. ELLIS, det. C. E. HUBBARD.

825/2b. GLYCERIA FLUITANS (L.) R. Br. var. TRITICEA (Fr.) Lange. 50, Denbigh; Ponty Pandy, Glyndyfrdwy, 1921, A. E. ELLIS, det. C. E. HUBBARD.

825/3(2). GLYCERIA DECLINATA Bréb. *1, W. Cornwall; Trevorian Common near Sennen, 1926, A. E. ELLIS, det. C. E. HUBBARD. *7, N. Wilts.; dried-up pond on Broughton Gifford Common, 1940, A. H. G. ALSTON, C. I. and N. Y. SANDWITH. *8, S. Wilts.; Folly Farm, Bedwyn, 1938, J. D. GROSE. 22, Berks.; muddy field by farm between Oxford and Eynsham, J. P. M. BRENAN. *50, Denbigh; Ponty Pandy, Glyndyfrdwy, 1921, A. E. ELLIS, det. C. E. HUBBARD.

*825/5. PUCCINELLIA MARITIMA (L.) Parl. 108, W. Sutherland; Keoldale, P. M. HALL and E. C. WALLACE.

825/8. PUCCINELLIA RUPESTRIS (With.) Fern. & Weath. 3, S. Devon; Wolborough, clay quay near river Teign, G. T. FRASER.

826/1. SCLEROPOA RIGIDA (L.) Griseb. 22, Berkshire, foot of old wall, Drayton, J. N. MILLS.

826/7b. FESTUCA RUBRA L. var. FALLAX Thuill. 3, S. Devon; Lustleigh: 37, Worcs.; on wall-top, Birt Street, Birtsmorton: F. M. DAY, det. C. E. HUBBARD.

*826/15. VULPIA MEMBRANACEA (L.) Dum. 69, N. Lancs.; Walney Island, W. H. HARDAKER.

†827/4. BROMUS TECTORUM L. 23, Oxon.; waste ground, Jackdaw Lane, Oxford, J. P. M. BRENAN.

†827/5. BROMUS MADRITENSIS L. var. **ciliatus** Guss., *Fl. Sic. Syn.*, i, 78 (1842). 1a, Scillies; Southward Bay, Bryher (Lousley, 1939 C.).

†827/13. BROMUS UNIOLOIDES H. B. K. 16, W. Kent; waste ground, High Brooms, J. P. M. BRENAN.

*†827/19(2). BROMUS LEPIDUS Holmberg. 61, S.E. Yorks.; Broomfleet, A. K. WILSON. Forma LASIOLEPIS Holmberg, Springhead, 1937, and Rickering roadside, Hull.—A.K.W.

†827/24. BROMUS SCOPARIUS L. 6, N. Somerset; waste ground, Bristol, C. I. SANDWITH. New to the Bristol list.

*828/2. BRACHYPODIUM PINNATUM (L.) Beauv. H. 33, Fermanagh; railway bank, Lisnarick, R. MACKECHNIE.

†832/1(2). **Triticum monococcum** L., *Sp. Pl.*, ed. i, 86, 153. Alien, eastern Medit. Reg. and cult. 18, S. Essex; waste ground, Dagenham, J. P. M. BRENAN and N. Y. SANDWITH.

†832/8. AEGILOPS TRIUNCIALIS L. 6, N. Somerset; waste ground, Bristol, C. I. and N. Y. SANDWITH. New to the Bristol list.

†832/11(2). AEGILOPS LIGUSTICA (Savign.) Coss. 18, S. Essex; waste ground, Dagenham, J. P. M. BRENAN and N. Y. SANDWITH.

†836/4(2). **Elymus crinitus** Schreb., *Beschr. Gräs.*, ii, 15, t. 24, f. i (1810). Alien, Medit. Reg. 6, N. Somerset; waste ground, Bedminster, Bristol, 1930, C. I. and N. Y. SANDWITH, det. C. E. HUBBARD. Previously recorded by C. T. SANDWITH (*1932 Rep.*, 363) as *E. caput-Medusae*, to which it is very closely allied, differing in the short and straight (not arcuate and divaricate) awns of the lemmas of the lower spikelets, N.Y.S.

844/3. EQUISETUM SYLVATICUM L. 16, W. Kent; copse, Lamberhurst Quarter, J. R. WALLIS.

*844/8. EQUISETUM TRACHYODON A. Br. 92. S. Aberdeen, J. R. MATTHEWS, *Journ. Bot.*, *78*, 21.

851/1. ASPLENIUM MARINUM L. 97, Westerness; north side of Loch nan Uamh; Luinga Mhor, Arisaig, J. S. WILKINSON. 108, W. Sutherland; Ceannabeinne Bay, Eilean Hoan, 1938, D. McCLINTOCK.

*854/3. POLYSTICHUM LOBATUM (Huds.) Woynar. 110, Outer Hebrides; S. Uist, Heslop Harrison (1939: 4).

854/4. POLYSTICHUM LONCHITIS (L.) Roth. H. 16, West Galway; Muckanaght, Twelve Bens, W. A. SLEDGE.

*856/2. DRYOPTERIS CRISTATA (L.) A. Gray. 17, Surrey; Bagshot area, 1938, L. G. PAYNE, *London Naturalist*, 1938.

856/5. DRYOPTERIS AEMULA (Ait.) Kuntze. 16, W. Kent; still (1941) near Brenchley, probably the only now existing Kent station. Prolonged search about Tunbridge Wells and Eridge in Sussex has failed to reveal the plant in other recorded stations. J. R. WALLIS.

*856/7. DRYOPTERIS OREOPTERIS (Ehrh.) Maxon. 43, Radnor; by Nant-henllan, near Llandeilo-graban, A. E. WADE.

856/9. DRYOPTERIS PHEGOPTERIS (L.) C. Chr. 41, Glamorgan; in great abundance and exceptional luxuriance in a new habitat within 7 miles of the centre of Cardiff, Miss WARE, comm. Miss E. VACHELL.

859/1. CETERACH OFFICINARUM DC. *43, Radnor; Rhayader, 1922, R. L. SMITH, comm. DEPT. BOT., NAT. MUS. WALES. 57, Derby; limestone rocks in Dovedale, W. H. HARDAKER.

*863/2. HYMENOPHYLLUM PELTATUM Desv. 45, Pembroke; Craig Lwyd, near Trecwn, 1856, Mrs RIPPON, and Treffgarne Rocks, 1931, Miss E. C. HOWELLS, comm. DEPT. BOT., NAT. MUS. WALES.

*867/1. PILULARIA GLOBULIFERA L. H. 35, N. Donegal; Lough Nacung, W. A. SLEDGE.

†868/1. AZOLLA FILICULOIDES Lam. 14, E. Sussex; near to, and S. of Camber Castle, Rye, H. E. BUNKER, comm. P. M. HALL.

869/1. ISOETES LACUSTRIS L. 103, Mid Ebudes; peaty tarns above Carsaig Arches, Mull, A. TEMPLEMAN, comm. A. J. WILMOTT.

870/5. LYCOPODIUM CLAVATUM L. 14, E. Sussex; heathy ground near Rowfant, 1940, E. C. WALLACE. 17, Surrey; still near the Nower, Dorking, 1940, W. E. CHINA, comm. E. C. WALLACE.

872/3. NITELLA FLEXILIS Agardh. 41, Glamorgan; specimens recorded (*1937 Rep.*, 597) as from Kenfig Pool, came from Mynydd-y-Glew, the only recognised locality in the county, E. VACHELL.

872/5. NITELLA TRANSLUCENS (Pers.) Ag. H. 16, West Galway; Renvyle: H. 35, N. Donegal; Lough Kindrum, W. A. SLEDGE.

872/9. NITELLA BATRACHOSPERMA (Rchb.) A. Br. *H. 16, West Galway; Renvyle: H. 35, N. Donegal; Lough Nacung, Gweedore, W. A. SLEDGE.

876/3. CHARA VULGARIS L. 109, Caithness; stream on Dunnet Links, P. M. HALL and E. C. WALLACE.

876/4. CHARA RUDIS (A. Br.) Leonh. H. 35, N. Donegal; Lough near L. Kinny, Fanad Head, W. A. SLEDGE.

876/7. CHARA CONTRARIA Kütz. H. 35, N. Donegal; Magheradrumman, Fanad Head, W. A. SLEDGE.

876/11. Chara aculeolata Kütz. 27, E. Norfolk; Roydon Fen, near Diss, 1938, E. C. Wallace and P. M. Hall.

876/12. Chara aspera Willd. H. 16, West Galway; Renvyle and Bunowen: H. 35, N. Donegal; Lough Mulladergh, The Rosses; Lough Kinny and Magheradrumman, W. A. Sledge.

876/13. Chara desmacantha Gr. & B.-W. H. 35, N. Donegal; Lough Kinny, W. A. Sledge.

876/16. Chara globularis Thuill. H. 16, West Galway; Renvyle, W. A. Sledge.

876/17. Chara delicatula Ag. 108, W. Sutherland; Blar nam Fear More, near Little Assynt, P. M. Hall and E. C. Wallace.

THE WEATHER OF 1939 AND 1940 AND ITS EFFECTS.

(Adapted by permission from the Phenological Reports of the Royal Meteorological Society.)

1939.

While there was a nearer approach to average conditions throughout the year than of late, there was again a spring with a succession of warm spells separated by brief cold spells. These were preceded by severe cold in late December and early January, and followed, after a warm and sunny early June, by a cool and comparatively sunless summer and early autumn, with the exception of a fine warm period in August and early September; as in the previous year, November was very warm. These conditions prevailed generally throughout the British Isles. There were, however, no destructive late frosts or drought of serious duration, such as occurred in 1938, and very few gales; another marked difference was in respect of the rainfall, which in 1938 was markedly below the average in the south-eastern and above the average in the north-western districts—district conditions which were reversed in 1939 when the greater excess periods occurred in the south-east.

While the severe cold in December-January did considerable damage to delicate plants, it did not adversely affect plant life in general. In south-eastern England, after this cold spell, the hazel was late, but the subsequent warm spells produced a forwardness with the same tendency to persist as was referred to in the 1938 Report, especially as regards insects, the larvae of which experienced early favourable conditions for feeding up after hibernation. In north-eastern England and the other later districts, the forwardness was less marked, and it is interesting to refer to the 1938 diagrams for these districts, and to note the very much earlier dates then caused by the more intense and longer warm spells in spring.

The general influence of the year's weather, so free from extremes, was favourable to fruit, cereal and root crops, and wild fruit was also plentiful. As regards grass, the graphs indicate conditions in striking contrast with those of the previous year, although the hay harvest was only fair. The weather was, however, generally favourable for harvesting the cereal crops. The absence of severe gales and of early frosts resulted in brilliant autumn colours in most districts. Second flowering of many plants occurred. In the late summer there was a plague of the larvae of the "cabbage white" butterflies, following migration of the insects from the continent.

1940.

This year furnished some striking features of phenological interest. It commenced with a prolonged cold spell, and January was probably the coldest for 100 years, although the sunniest for 50 years. February was very dull with one very cold week. After that, a succession of warm spells followed, separated by comparatively few cold ones, with ample rain and sunshine. Droughty conditions occurred in May and June and again, after a cool and showery July, in August and early September, terminated by a cool moist period after which conditions were not far from average until the end of November. There was general similarity between the weather of south-east and north-west districts. The marked lateness of both plants and insects caused by the cold opening to the year gave place to considerable earliness which mainly persisted from the end of April, and the beauty of spring and early summer was enhanced by the simultaneous flowering of the normally early species which had been retarded and the normally later species which had been brought forward. Alpine plants in Perthshire and Argyll were earlier in flowering than is usual on the western Breadalbane hills, many sedges being in good fruit up to 3000 feet O.D. at the end of June.

The recovery also applied to crops, although some autumn-sown cereals failed to survive the winter and the plum crop was badly damaged by a cold spell. An interesting point emerges concerning the effect of drought on grass; in the N.W., with rainfall 30% of the average, hay was assessed during August as remaining between 77% and 78%, but in the S.E., with rainfall only 3% of the average, the hay deteriorated from 77% to 56%. The large white butterfly again arrived in great numbers and a plague of larvae ensued which caused much damage. Hundreds of pupae were seen by Mr H. W. Pugsley and myself on twigs and leaves of a hedge in a lane near Liphook, Hampshire.

At the end of January many parts of southern and south-central England experienced a severe ice storm which wrought much havoc to trees and shrubs; Wiltshire, Gloucestershire, Berkshire and, to a lesser extent, Surrey and North Hampshire, being most effected. After severe cold a slight thaw with east wind, rain and fog caused a coating of ice to form on twigs and branches of trees, telegraph wires, etc. For two days the ice increased in thickness, weighing down branches and causing severe fractures. The coating of ice varied in thickness from ½ inch to 3 inches in exposed places. The trees that suffered most were the Oaks, Beech, Spanish Chestnut, Ash, Elm, Poplar, and Maple. Young birches were often snapped off half way up.

E. C. WALLACE.

NOMENCLATURE AND CORRECTIONS TO BRITISH PLANT LIST.

A. J. Wilmott.

Nomenclature is admittedly a troublesome and difficult subject, but it cannot be ignored in our Reports, for which it is necessary to adopt some definite plan to obtain as great a measure of uniformity as possible. In the recently-issued second part of the Report for 1938, the name used in the second edition of the *British Plant List* was added when it was not adopted, but the correction of the proofs of the present *Report* showed that to do this consistently would involve so much extra printing of synonyms, often repeated, as to be impracticable.

Differences in nomenclature arise in many ways. Since the publication of the *British Plant List*, ed. 2, alterations to the International Rules of Botanical Nomenclature have necessitated many changes, particularly by the adoption of a rule invalidating later " homonyms " (i.e. later independent uses of the same name; e.g. *Viola silvestris* Kit. in Schultes (1814) cannot now be adopted because there exists the earlier but illegitimate *Viola silvestris* Lam. (1778) (*nomen superfluum*), and the plant commonly called *V. silvestris* must now be called *V. Reichenbachiana* Jord., by which name it was formerly well known). For an account of the Rules see *1932 Rep.*, 300-313, but further changes were adopted in 1935.

Again, Dr Druce did not follow some of the prescriptions of the International Rules, and many changes must arise therefrom. In particular, the Rules do not permit the use of a " tautonym," i.e. a specific name composed of the same word repeated, e.g. *Glaucium Glaucium* (L.) Karst., and such names must be replaced. Other changes arise when investigation shows that a given name does not belong to the plant for which it is currently used, as when it was shown that *Agrostis alba* of Linnaeus was not even an *Agrostis* but was the shade form of *Poa nemoralis* L. with single-flowered spikelets.

Uniformity in nomenclature can never, however, be absolute, as there can be quite legitimate divergencies due to differences of opinion. Views vary as to the best limits to be assigned to genera, and one author may quite legitimately prefer *Scirpus rufus* L. to *Blysmus rufus* (L.) Panz. Similarly, some varieties of the *Plant List* may legitimately be treated as species, subspecies or forms. Again, the interpretation of some old name may not be as clear as that of *Agrostis alba* L., and there may be some disagreement as to its application, so that a given name, e.g. *Orchis maculata* L., may be currently used for different species; such divergent uses are then indicated in the citation of the authority, either " L. sec. Druce " [i.e. = *O. ericetorum* (Linton) E. S. Marshall] or " L., (et) auct. plur." or " L.; Godfery " [i.e. = *O. Fuchsii* Druce]. And yet again, there are still some differences of opinion regarding the interpretation and/or application of certain of the Rules which can only be settled at some future International Botanical Congress.

It is therefore clear that authors who hold definite opinions on certain of these matters must be free to adopt in their articles names not accepted for the revision of the *Plant List*, so long as their meaning is made clear by the additional citation of the name (or number) in that List. But some means of avoiding continual citation of synonyms is needed, and I had therefore intended to include under the title of this note an annotated list of all the departures from and additions to the editorially annotated copy of the *Plant List* which were adopted or suggested in the Reports for 1938, part ii, and 1939/40, thus enabling members to correct their copies with ease and permitting a fully corrected copy to be used as the standard of nomenclature for the Reports. Mention has been made elsewhere of the corrected copy kept up to date by the late editor, but examination of this shows that the corrections are far from complete and often need further checking, and they have not been collected together as was done for corrections to the *Comital Flora*.

Having made a full list of all the departures from the corrected copy of the *Plant List* occurring in the Reports mentioned, it was clear that the time required for the adequate investigation of all would unduly delay publication, and that some problems could not be investigated at all owing to the evacuation of the necessary books or specimens. The corrections now listed are therefore limited to those which can be set out without delaying publication, and do not include minor corrections (such as the completion of the double citations of authors so frequently incomplete in *B.P.L.*) unless there is any special reason for their inclusion. The purely nomenclatural matter already set up in type in Plant Notes and Plant Records, although it would be better transferred here, has been omitted, as have also the new names already set up in heavy type, which can easily be picked out by those who wish to correct their Plant Lists, but heavy type is not used elsewhere for mere name-changes inserted here. The desirability of printing the full list (or a complete list of accepted corrections to *B.P.L.*) in a subsequent Report will be considered, and must partly depend on the possibility of bringing out a new edition of the Plant List within a reasonable time. Meanwhile, the citation of the *B.P.L.* number against a name is, in the present Report, regarded as a sufficient indication of synonymy when some other name has been adopted. In a very few instances, departures from the annotated *B.P.L.* are not noted in the following list, because it has not been possible to complete the investigation; the name adopted is probably the correct name, but it is undesirable to make the alteration in *B.P.L.* until all relevant books and specimens have been examined.

The types and signs used in these corrections will be those used in the *Plant List* itself, i.e. names in black type indicate native plants; in black type with asterisk, denizens, looking native but doubtfully indigenous; in starred italics, naturalised aliens; in unstarred italics, more or less adventive plants: see *Plant List*.

35 **NASTURTIUM.**

1 **officinale.**

d. **microphyllum** Boenn.

87 **HELIANTHEMUM.**

2 **Chamaecistus** Mill.—*Vice* tautonym. If *Cistus nummularius* L. is considered to belong to this species, the name *H. nummularium* (L.) Mill. will take precedence.

88 **VIOLA.**

3 **Reichenbachiana** Jord. ex Boreau. (V. silvestris Kit. ex Schultes, non Lam.).

89 **POLYGALA.**

4 **oxyptera** Rchb.—This name is adopted as I cannot at present distinguish Reichenbach's plant from the British plants called *P. dubia* Bellynck.

93 **TUNICA.**

1 **prolifera.**

b. **laevis** (Clav.) Rouy & Fouc.—See Plant Notes.

96 **SILENE.**

2 **Cucubalus** Wibel.—*Vice S. angustifolia* S. & T.; see 1932 Rep., 312.

*2(2) *Tenoreana* Colla.—*S. angustifolia* [Ten.] Guss. 1827, *nomen illegitimum* (homonym of *S. angustifolia* Poir. 1789).

b. *carneiflora* (Legrand) Wilmott—comb. nov.; see Plant Notes.

102 **ARENARIA.**

7 **peploides** L.—With small initial "p."

103 **SAGINA.**

3 **intermedia** Fenzl in Ledeb.—*S. caespitosa* (Vahl) Lange is very different from our British plant; the use of that name was due to misunderstanding. The statement that *S. nivalis* Fr. was the same as *S. caespitosa* meant that neither name could be used for our plant, which is *S. intermedia* Fenzl in Ledeb.

105 **SPERGULARIA.**

2 **marginata** (DC.) Kittel.—It is doubtful whether *Arenaria media* L. 1762 belonged to this species.

5 **rubra** (L.) J. & C. Presl.—There seems no reason for rejecting this name in favour of *S. campestris* (L.) Asch.

108 *CLAYTONIA.*

*1 *alsinoides* Sims.—With small initial " a."

112 HYPERICUM.

11 **quadrangulum** L. (H. tetrapterum Fr.).—The type of the Linnean name, based on a definitive phrase taken from the *Hortus Cliffortianus*, is a specimen of " *H. tetrapterum* Fr." in Clifford's herbarium. This application is made quite clear, though not adopted, by Pugsley (1940: 25-36).

12 **dubium** Leers. (H. quadrangulum auct. aliq.).

13 [delete]—*H. Desetangsii* Lamotte = × *H. intermedium* (*H. perforatum* × *quadrangulum*): see Pugsley 1940, 36.

117 MALVA.

3 **neglecta** Wallr. (M. rotundifolia auct. plur.).

4 *rotundifolia* L. (M. pusilla Sm.).—The definitive reference given by Linnaeus is from Hort. Cliff., and the type, in Clifford's herbarium, is what has been called *M. pusilla* Sm.: cf. also 1937 Rep., 442.

124 RADIOLA.

1 **Linoides** Roth.—*Vice* tautonym; Roth rightly used the capital " L."

125 LINUM.

1 **bienne** Mill.—Now generally identified with *L. angustifolium* Huds., which it antedates.

127 GERANIUM.

14 Robertianum.

g. **intermedium** Wilmott.—Wrongly placed in *B.P.L.* as a variety of *G. purpureum* (15c).

133 IMPATIENS.

*4 *Roylei* Walp.—*I. glandulifera* Royle 1839, non Arn. in Hook. 1835.

153 MEDICAGO.

1 **falcata** L.—With small initial " f."

6 **minima** (L.) Bartal.—The objection raised by Rendle and Britten (1907: *Journ. Bot.*, xlv, 437) to the citation of Bartalini as author of this combination is without foundation, being due to insufficient examination of Bartalini's work, in which the names *follow* the references given, and do not precede them as Rendle and Britten assumed.

d. *recta* (Desf.) Burnat.—*Vice* longiseta DC.

173 ONOBRYCHIS.

1 **viciifolia** Scop. [" viciaefolia "].—*Vice* tautonym.

176 **VICIA.**
26 *pannonica.*
b. *purpurascens* (DC.) Boiss.—*Vice striata* (MB.).

197 **COTONEASTER.**
1 **integerrima** Medik.—*Vice* tautonym.

223 *OENOTHERA.*
*3 *stricta* Ledeb. (O. odorata auct. angl., non. Jacq.).

261 **ANTHRISCUS** Pers. Syn. i, 320, 1805, emend. Hoffm. Gen. Umbell. i, 38, 1814, *nomen conservandum propositum* 1935; (non Bernh. 1800).
1 **sylvestris** (L.) Hoffm.
2 **Scandix** (Scop.) Aschers. (A. vulgaris Pers., 1805, non Bernh., 1800).
*3 *Cerefolium* (L.) Hoffm.

296 **GALIUM.**
4 **saxatile** L.—*Vice G. hercynicum* Weig. The locality cited for *G. saxatile* was Barcelonette, in the south of France, but this was misinterpreted as being Barcelone, where the species does not occur, and the name was unnecessarily rejected.

333 **INULA.**
4 **Conyza** DC. (I. squarrosa (L.) Sch. & Thell., non I. squarrosa L.).

334 **PULICARIA.**
2 **vulgaris** Gaertn.—*Vice* tautonym.

386 *CRYPTOSTEMMA* R. Br. in Ait.
1 *calendulaceum* (L.) R. Br. in Ait.—Not (L.) Druce.

395 **CARDUUS.**
3(2) tenuiflorus Curt.—*Vice* 3b.

405 **CENTAUREA.**
31 *solstitialis* L.—With small initial " s."

415 **PICRIS.**
1 **echioides** L.
2 **hieracioides** L.—The use of initial capitals for these two specific epithets, rightly used by Linnaeus in other genera, appears to be erroneous here, as neither species had been referred to the old genera, i.e. to *Echioides* or *Hieracioides* respectively.

419 **HIERACIUM.**
*8 *brunneo-croceum* Pugsl. (H. aurantiacum auct., non L.).
*9 *aurantiacum* L. sec. Pugsl. (=ssp. claropurpureum Naeg. & Pet.).—Cf. Pugsley 1921, in *Journ. Bot.*, lix, 60-69.

423 **TARAXACUM.**
15 **palustre** (Lyons) DC.—*Leontodon palustre* Lyons 1763, Fasc. 48. The type locality was Hinton Moor (now drained), near Cambridge, and until any locality nearer to Cambridge is ascertained, the name is taken to apply to the plant found in Wicken Fen.

435 **CAMPANULA.**
4 **rapunculoides** L.—With small initial "r."

443 *GAULTHERIA.*
*1 *Shallon* Pursh.—With initial capital "S," as used by Pursh, the epithet being a vernacular Indian name for the plant.

458 **ARMERIA** Willd., *nomen conservandum propositum* 1935 (and 458/4 **A. maritima** Willd.).—May be used in place of *Statice* while the matter is still *sub judice*.

477 **BLACKSTONIA** Huds.—The original spelling.

515 **CUSCUTA.**
4 **Trifolii** Bab.—With initial capital "T," as used by Babington.

535 **SCROPHULARIA.**
3 **umbrosa** Dum.—*S. alata* Gilib. is *nomen illegitimum* (*superfluum*). *S. Neesii* Wirtgen has been suggested as being the name of this plant, but I have seen no British specimens agreeing with Wirtgen's descriptions, figure of staminode, and specimens.

558 **MENTHA.**
2 **alopecuroides** Hull.—The original spelling, with small initial "a," which is correct.

600 **CHENOPODIUM.**
11 [*pratericola* Rydb.]
b. *Thellungianum* Aell. (C. leptophyllum auct., non Nutt.).—See Plant Records.

606 **ATRIPLEX.**
8 **laciniata** L. (A. maritima Hallier. *nomen illegitimum*).—Linnaeus's definitive reference is from the Hortus Cliffortianus, and the type in Clifford's herbarium is this species.

615 **POLYGONUM.**

6 **lapathifolium** L.—With small initial "l," the capital being used in error by Linnaeus.

618 **RUMEX.**

8 **nemorosus** Schrad.—This name is generally cited as "Schrad. ex Willd., 1809," but sometimes as from Schrader's Cat. Hort. Goett. 1806, a rare work of which I have been unable to trace a copy. If there is a description in that earlier work to validate Schrader's name from 1806, it will take precedence over *R. condylodes* MB., which dates from 1808.

647 **CASTANEA.**

*1 **sativa** Mill.—*Vice* tautonym.

659 **HAMMARBYA** O. Kuntze, Revis. ii, 665, 1891. (Malaxis Lindl., non Sw.).

1 **paludosa** (L.) O. Kuntze.

668 **EPIPACTIS** [Zinn.] Swartz in Vet.-Akad. Handl., Stockholm, xxi, 232, 1800, emend. L. C. Rich. in Mém. Mus. Par. iv, 51, 60, 1818, *nomen conservandum propositum* 1935.

1 **palustris** (L.) Crantz.
2 **Helleborine** (L.) Crantz emend. Rend. & Britt.
3 **leptochila** Godfery.
3(2) **dunensis** (T. & T. A. Steph.) Godfery.—*Vice* 3b.
3(3) **vectensis** (T. & T. A. Steph.) Brooke & Rose.—*Vice* 3c.
4 **purpurata** Sm.
5 **atropurpurea** Rafin.

669 **ORCHIS.**

10 **ericetorum** (Linton) E. S. Marshall.—The correct application of the name *O. maculata* L. is still unsettled. Although it seems probable that it should be adopted for the next species, it can quite legitimately be used for this species if cited as of "L. sec. Druce." The name *O. elodes* Griseb. is not adopted as there is some doubt concerning the identity of Grisebach's plant.

11 . . . . . —If the name *O. maculata* L. is used for this species, the application should be made clear either by the citation of the *B.P.L.* number or of the synonym *O. Fuchsii* Druce, or citation of a second author, e.g. "L. sec. Godfery."

715 **TOFIELDIA.**

1 **borealis** (Wahl.) Wahl.—*T. palustris* Huds. is *nomen illegitimum superfluum* = *Anthericum calyculatum* L., with which Hudson misidentified the British plant.

730 **BALDELLIA** Parl. Nuov. Gen. Monoc., 57, 1854.

1 **ranunculoides** (L.) Parl.—This species does not belong to the well-marked natural genus *Echinodorus* Rich.

746 **SCIRPUS.**

12 **cernuus** Vahl.—*Scirpus filiformis* Savi 1798 is *nomen illegitimum* (homonym of *S. filiformis* Lam. 1791). *S. pygmaeus* (Vahl) A. Gray 1868 is also *nomen illegitimum* (homonym of *S. pygmaeus* Lam. 1791). *S. cernuus* Vahl was published as a species distinct from *Fimbristylis pygmaea*, but their conspecificity was accepted by C. B. Clarke (in Hook. 1894: *Fl. Brit. Ind.* vi, 655, in note under *S. setaceus*), Ascherson and Graebner (1904: *Syn.* II, 2, 308), and Briquet (1910: *Fl. Cors.* i, 229). In the genus *Fimbristylis* the valid name is *F. pygmaea* Vahl.

747 **ERIOPHORUM.**

1 **latifolium** Hoppe.—*Linagrostis paniculata* Lam., on which Druce bases *E. paniculatum*, is *nomen illegitimum superfluum*.

753 **CAREX.**

19 **Hostiana** DC (C. fulva Host., non Good.).
22 **viridula** Michx. (C. Oederi auct., non Retz.).
d. **elatior** (Anders.) Wilmott.—Comb nov.
60 **spicata** Huds. (*C. muricata* auct., vix L.).
75 **dioica** L.
b. **isogyna** (Fr.) Hartm.—Cf. Plant Notes.

780 **AGROSTIS.**

2 **stolonifera** L. (A. palustris Huds.).—*Agrostis alba* L. was not an *Agrostis* at all, but was *Poa nemoralis* var. *uniflora* M. & K.

783 **CALAMAGROSTIS.**

2 **canescens** (Weber) Gmel. emend. Druce.—*Vice* tautonym.

802 **PHRAGMITES.**

1 **communis** Trin.—*Vice* tautonym.

825 **GLYCERIA.**

1 **maxima** (Hartm.) Holmberg.—*G. aquatica* (L. 1753: *Poa* sp.) Wahl. 1820, *nomen illegitimum* (homonym of *G. aquatica* (L. 1753: *Aira* sp.) J. & C. Presl 1819).

826 **FESTUCA.**

18 **myuros** L.—The original spelling, with small initial "m."

827 **BROMUS.**
13 *unioloides* (Willd.) H.B.K.—With small initial " u."

847 **PTERIDIUM** Scop. *Fl. carn.* 169, 1760, emend. Kuhn *Bot. Ost.-Afr. Deck.* Reis. III, III, 11, 1879, *nomen conservandum propositum* 1935.
1 **aquilinum** (L.) Kuhn.

859 **CETERACH.**
1 **officinarum** DC.—*Vice* tautonym.

DRUCE'S COMITAL FLORA: CORRECTIONS AND SUGGESTIONS.

ALBERT WILSON.

In looking through *The Comital Flora of the British Isles*, by the late Dr G. C. Druce, I have noticed a number of errors, and there are also some cases where the information regarding altitudinal range might be amended or slightly extended in any future edition of the Flora. Particulars as to these errors and suggestions are given in the following notes. I have also added a number of new records. They do not claim to be at all exhaustive, and there may be other cases where vice-county numbers have been incorrectly inserted or new records overlooked.

In order to save space the following reference numbers are used. Where no reference is given I am responsible for the statement.

REFERENCES.

(1) *The Flora of Northumberland and Durham*, by G. R. Tate and J. G. Baker, 1868.

(2) "West Lancashire Flora Notes," by J. A. Wheldon and A. Wilson. *Lancashire and Cheshire Naturalist*, May 1925.

(3) "The Altitudinal Range of British Plants," by A. Wilson. Reprinted from *The North Western Naturalist*, 1931.

(4) *The Flora of Westmorland*, by A. Wilson, 1938.

(5) *The Flora of Devon*, by W. K. Martin and G. T. Fraser, 1939.

(6) "Further Notes on the Altitudinal Range of British Plants," by A. Wilson. Reprinted from *The North Western Naturalist*, 1940.

(7) *The Naturalist*.

(8) *The North Western Naturalist*.

(9) *A Supplement to the Yorkshire Floras*, by F. A. Lees, edited by C. A. Cheetham and W. A. Sledge, 1941.

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p. 2, line 16, for "(Wilson)" read "(Bickham)."

p. 3, line 17, add "61" (9).

p. 4, line 7, for "1500 ft. in Swaledale" add or substitute "1900 ft. on Dartmoor" (5).

p. 4, line 21, add "60" (2).

p. 5, line 3 from bottom, add "61" (9).

p. 6, line 16, add "69."

p. 6, line 7 from bottom, for "1150" read "1800," J. F. Pickard (7), May 1937.

p. 7, line 3, after "Malham" add "Tarn."

p. 8, line 2 from bottom, for "3500" read "3600," J. W. H. Trail and F. B. White.

p. 9, line 20, add "47-49, 62-69."

p. 10, line 8, add "60" and remove from bracketed list.

p. 11, line 4, for "1650" read "1050."

p. 11, line 3 from bottom, for "on" read "in."

p. 11, line 2 from bottom, for “(Wilson)” read “(Salter).”

p. 12, line 22, for “on Angle Tarn” read “in Angle Tarn, Patterdale.” (There are two Angle Tarns in the Lake District.)

p. 12, line 23, for “Donegal” read “1100 ft. in Donegal, H. C. Hart in *Fl. of Donegal*.”

p. 15, line 7, after “1200 ft. on Dartmoor,” add “1300 ft. in Denbigh,” Dallman (8), 1932.

p. 20, line 23, for “1850 ft. in W. Yorks.” read “2470 ft. in Westmorland.”

p. 21, line 15 from bottom, delete “61” (9).

p. 25, line 5, after “Ben More” add “Assynt.”

p. 25, line 11 from bottom, add “61” (9).

p. 27, line 9 from bottom, after “Lowland” insert “1430 ft. in Salop.”

p. 28, line 8, add “69,” G. M. Brown.

p. 30, Add “*Brassicella Wrightii* O. E. Schulz,” and particulars concerning it.

p. 31, line 22, add “60,” J. Moss (2).

p. 32, line 16 from bottom, for “(Wilson)” read “(Marshall).”

p. 33, lines 11 and 12, after “ascends to,” read “2900 ft. in Angus, 2800 ft. on Helvellyn, and descends to 25 ft. in Wales.”

p. 33, line 24, for “750 ft. on the Matlock Tor” read “1080 ft. in Derby (Dovaston).”

p. 33, line 7 from bottom, for “(Wilson)” read “(Baker)” (1).

p. 37, line 6 from bottom, for “1000” read “1660.”

p. 38, line 17 from bottom, for “1200 ft. on Grange Scar” read “1950 ft. on Long Fell, near Hilton.”

p. 39, line 19, place “Wilson” in brackets.

p. 39, line 12 from bottom, for “Thirsk” read “62.”

p. 39, line 8 from bottom, add “61, 64” (9).

p. 40, line 10, add “60,” J. W. Hartley and J. A. Wheldon (2).

p. 40, line 14, add “62” (9).

p. 40, line 22, add “60.”

p. 40, line 14 from bottom, add “62, 64, 65” (9).

p. 40, line 10 from bottom, add “62, 64” (9).

p. 40, line 2 from bottom, add “62” (9).

p. 41, line 3, add “61” (9).

p. 41, line 7, add “62” (9).

p. 41, line 13 from bottom, for “630-640” read “630-1640,” Burkill and Willis, *Journ. Bot.*, 1894.

p. 42, line 18 from bottom, for “1490 ft. on Tarnbrook Fell” read “about 2000 ft. on Dartmoor” (5).

p. 42, line 3 from bottom, add “1850 on Dartmoor” (5).

p. 43, line 21, for “63” read “64.”

p. 44, line 18, delete “61” (9).

p. 45, line 9, add "69" (4).
p. 45, lines 17-18, for "480 ft. in Caernarvon; 800 ft. in Cardigan," read "2300-2500 ft. on Cader Idris (Evans)" (6).
p. 46, line 15 from bottom, for "2000" read "2500."
p. 48, line 15, for "1650 ft. in Harwood Dale" add or substitute "1900 ft. on High Cup Scar."
p. 50, line 5, for "2700 ft. on Helvellyn and Carnedd Llewelyn" read "2700 ft. on Carnedd Llewelyn and 2850 ft. on Helvellyn."
p. 50, line 21, insert "and to 3700 ft. on Ben MacDhui (Wilmott)."
p. 51, line 16 from bottom, after "Mayo" add "and ascends to 1200 ft. on Benbradagh, Derry, *Fl. of North-east of Ireland*, 2nd edition, 1938."
p. 55, line 2, add "69."
p. 55, line 5 from bottom, for "2400" read "2750."
p. 59, line 6 from bottom, add "60," Dr Ellis (2).
p. 64, line 5, for "*tetraspermum*" read "*tetrapterum*."
p. 64, line 14 from bottom, after "Yorks." add or substitute "1430 ft. in Salop."
p. 65, line 13 from bottom, delete "69." (This was an error. The late Mr W. H. Pearsall told me the record referred to *M. sylvestris*.)
p. 67, line 14, for "*grandiflora*" read "*grandifolia*."
p. 67, line 5 from bottom, add "69" and delete "69" from the bracketed list.
p. 69, line 21 from bottom, for "1680" read "2100."
p. 70, line 20, add "69" (4).
p. 72, line 26, add "69" (4).
p. 74, line 5, add "69."
p. 74, line 14, add "60," J. N. Frankland; add "63. 64" (9).
p. 74, line 11 from bottom, for "*Evonymus*" read "*Euonymus*."
p. 75, line 18, add "to about 1250 ft. near Malham Tarn (W. West)" (6).
p. 76, line 23, after "Lowland" add "ascends to 1750-1780 ft. on Cader Idris (Evans & Salter)" (6).
p. 77, line 19, add "56," John Brown (8), September 1941, p. 207; add "62" (9).
p. 78, line 18 from bottom, substitute a small "f" for the capital "F" of *falcata*.
p. 81, line 4, add "1500 ft. in Durham" (1).
p. 85, line 16, I know of no record for v.-c. 60.
p. 86, line 6, for "1200 ft. in Westmorland; 1500 ft. on Kirkstone Pass," substitute "1500 ft. on Kirkstone Pass, Westmorland." Also add "1600 ft. on Dartmoor" (5).
p. 86, line 17, for "on" read "in."
p. 87, line 8 from bottom, add "69" (4).

p. 89, line 7, for "1800 ft." read "1770 ft."

p. 91, line 15 from bottom, add "69," G. M. Brown.

p. 93, line 20, delete "62" (9).

p. 94, line 2, add "63" (9).

p. 94, line 6 from bottom, for "1500 ft." substitute "2000 ft. in Cwm Idwal."

p. 94, line 19, delete "1500 ft. in Wales."

p. 95, line 9 from bottom, add "69" (4).

p. 95, line 2 from bottom, for "1050" read "1130."

p. 98, line 18 from bottom, after "Pikes" insert "2830 ft. on Helvellyn."

p. 99, line 3, for "(Wilson)" read "(Baker)" (1).

p. 99, line 14, delete "base of Pillar Rock."

p. 99, line 26, after "Craig Breidden" add "formerly, now extinct, but still in 43."

p. 99, line 29, for "[48]" read "[47]." (Craig Breidden is in v.-c. 47, not 48.)

p. 100, line 22, delete the "60" in the bracketed list. (It is native and locally abundant in v.-c. 60.)

p. 102, line 12, for "2550 ft." read "2800 ft."

p. 102, line 23, add "65" (9).

p. 103, line 8, add "64" (9).

p. 105, line 20 from bottom, delete "57, 62, 63, 64."

p. 105, line 15 from bottom, for "1350 ft. in Yorks." substitute "1700 ft. in Westmorland."

p. 106, line 6, add "64" (9).

p. 107, line 8, for "1-39, 41, 44, 50, 55, 59, 61, 65-70" read "1-70."

p. 107, line 5 from bottom, add "60, 63, 64."

p. 108, line 10, add "60, 63, 64" (9).

p. 108, line 16, add "65" (9); add "69" (4).

p. 108, line 21, add "64" (9).

p. 109, line 15, add "60."

p. 109, line 7, add "64" (9).

p. 109, line 22 from bottom, add "60, 63, 64."

p. 113, line 14 from bottom, for "on Piers Gill" read "in Piers Gill," and add "2730 ft. on Helvellyn."

p. 113, line 3 from bottom, for "2700 ft." read "2850 ft."

p. 114, line 16 from bottom, for "2700 ft." read "2850 ft."

p. 114, line 15 from bottom, delete "1200 ft. at Cheddar," and insert "200 ft. at Cheddar."

p. 115, line 8 from bottom, for "1500 ft." read "1800 ft. in Yorks. (Sledge)."

p. 118, line 3, after "Mickle Fell" insert "2850 ft. on Helvellyn."

p. 118, line 15, for "1750 ft. on Snowdon" read "2680 ft. in Cwm Glas, Snowdon (Wilson)."

p. 118, line 6 from bottom, add "69."

p. 119, line 8, add "69."

p. 120, line 1, for " Acle " read " Adel."
p. 120, line 10, delete " 65 " (9).
p. 120, line 15 from bottom, add " 65."
p. 120, bottom line, add " 69 " (4).
p. 122, line 9, add " 64 " (9).
p. 122, line 22 from bottom, for " 2700 ft." read " 2900 ft."
p. 122, line 6 from bottom, " extinct ? in 60."
p. 123, line 9 from bottom, for " 1562 ft. in Watendlath " substitute " 1700 ft. in Westmorland."
p. 124, line 3, for " at Glyder Fawr " read " on Glyder Fawr."
p. 124, line 7, add " 60."
p. 124, line 17 from bottom, delete the " 60 " in the list of exceptions.
p. 124, line 8 from bottom, add " 60 " (2), " 64 " (9).
p. 125, line 20, add " 64, 69."
p. 126, line 5, after " and " add " 1530 ft. in " (6).
p. 127, line 22, add " 63, 64 " (9); add " 69 " (4).
p. 130, line 22, for " 1300 ft. in Cumberland; 1500 ft. on The Haystacks," substitute " 1500 ft. on The Haystacks, Cumberland " (3).
p. 131, line 12, some mistakes here.
p. 132, line 23, add " 60."
p. 134, line 10 from bottom, delete " 61, 62, 65 " (9).
p. 135, line 3, add " 65 " (9).
p. 137, line 8, add " 69."
p. 137, line 14, for " 1800 ft. on Great End " substitute " 2650 ft. in Westmorland."
p. 137, line 9 from bottom, for " (Wilson) " read " Baker) " (1).
p. 138, line 9 from bottom, for " 1200 ft. in Derby " substitute "1900 ft. on High Cup Scar."
p. 141, line 2 from bottom, add " 60."
p. 142, line 9 from bottom, for " 2100 ft. in Teesdale " add or substitute " 2600 ft. on Helvellyn."
p. 143, line 6 from bottom, for " 1850 ft. on Dent Crag " substitute " 2700 ft. on Helvellyn."
p. 145, line 1, add " 61 " (9).
p. 146, line 18 from bottom, for " 1350 ft. in Yorks." substitute "1525 ft. in Teesdale."
p. 146, line 17 from bottom, I think " but perhaps planted over 1000 ft." would be better omitted. It has certainly not been planted on Tal-y-Fan near Ro Wen at 1440 ft.
p. 148, line 12 from bottom, delete " 63 " (9).
p. 149, line 19, for " 3000 ft. on Scawfell " add or substitute " 3110 ft. on Helvellyn."
p. 150, line 23, for " (Wilson) " read " (Baker)."
p. 150, line 6 from bottom, for " 2200 ft." read " 1200 ft."
p. 154, line 16 from bottom, after " 2000 ft. " for " in " read " on."
p. 156, line 22, for " 60 " read " 69."

p. 157, line 6, delete "69."
p. 160, line 9 from bottom, after "Lowland" insert "900-1000 ft. in West Yorks. (Pickard)" (6).
p. 163, line 6, add "69" (4).
p. 165, line 15 from bottom, for "1950 ft. on Highfield" substitute "2050 ft. in Westmorland."
p. 166, line 8, add "69" (4).
p. 166, line 17 from bottom, add "60," H. E. Bunker; add "69" (4).
p. 168, line 3, add "69."
p. 170, line 7, delete "69."
p. 171, line 12 from bottom, delete "69."
p. 172, line 3, for "300" read "200."
p. 172, line 25 from bottom, for "900 ft. in Monmouth" substitute "1100 ft. on Dartmoor" (5).
p. 172, line 8 from bottom, for "1250 ft." read "1330 ft."
p. 173, line 9 from bottom, for "2700 ft." read "2850 ft."
p. 174, line 4, after "Lowland" for "1250 ft. in Wales" substitute "1850 ft. in Devon" (5).
p. 174, line 16, delete "69."
p. 174, line 12 from bottom, add "60" (2).
p. 176, line 8, add "61" (9).
p. 177, line 7, for "1950 ft. on Helvellyn" substitute "2100 ft. on Dove Crag, Patterdale."
p. 177, line 21, add "60," H. E. Bunker.
p. 179, line 17 from bottom, after "Highlands," add "1850 ft. in Devon" (5).
p. 180, line 21 from bottom, after "ascending to," insert "1650 ft. in Salop."
p. 181, line 3, after "ascending to," insert "about 2400 ft. in Westmorland."
p. 181, line 5, add "69."
p. 181, line 23, I have no record for 69.
p. 184, line 16 from bottom, for "1500 ft. in Wales" read "1700-1750 ft. on Carnedd Llewelyn," E. Dovaston.
p. 184, line 12 from bottom, add "69," W. H. Pearsall.
p. 185, line 14 from bottom, delete "62" (9).
p. 186, line 11 from bottom, delete "62-64" (9).
p. 188, line 17 from bottom, for "Gorlpe" read "Gorple."
p. 192, line 15, for "Broon" read "Brecon."
p. 195, line 16 from bottom, for "1650 ft. in Widdale" read "2000 ft. on Penyghent" (6).
p. 195, line 8 from bottom, after "ascends to" insert "2470 ft. in Westmorland."
p. 196, line 6 from bottom, for "Senner" read "Semmer."
p. 196, line 12 from bottom, delete "63" (9).
p. 197, line 20 from bottom, add "60."
p. 199, line 5, for "1400 ft. in Westmorland" read "1500 ft."

p. 199, line 5, for " 1450 ft. in Brecon " add or substitute " 1920 ft. in Cwm Idwal."
p. 199, line 17, for " (Salter) " read " (Wilson)."
p. 199, line 14 from bottom, add " 69."
p. 201, line 2, add " 62 " (9).
p. 202, line 17, delete " 62 " (9).
p. 204, line 9, add " 65," and remove " 65 " from bracket list (9).
p. 205, line 6, add " 65 " (9).
p. 206, line 15, add " 60," J. N. Frankland.
p. 206, line 11 from bottom, add " 62, 64, 65 " (9).
p. 207, line 21 from bottom, add " (65) " (9).
p. 207, line 17 from bottom, for " 1250 ft. in Yorks." substitute "1700 ft. in Westmorland."
p. 207, line 14 from bottom, add " 69."
p. 208, line 6, delete " 69 " from the exceptions.
p. 210, line 20, add " 64 " (9).
p. 210, line 15 from bottom, I know of no record for 69.
p. 213, line 8 from bottom, add " 64 " (9).
p. 215, line 20 from bottom, delete " 61;" add " 62, 65 " (9).
p. 216, line 1, add " 69," B.E.C. Excursion, 1938.
p. 216, line 12 from bottom, add " 62 " (9).
p. 217, line 24, for " 1600 ft. on Cautley Crag " substitute " 2030 ft. on Dove Crag, Patterdale."
p. 217, line 11 from bottom, delete " 69."
p. 218, line 14 from bottom, after " Highlands " insert " 2400 ft. on Knock Fell.
p. 220, bottom line, for " 1500 ft. in Weardale (Salter) " read " 1000 ft. in Weardale (Baker) " (1).
p. 221, line 10, for " in Malham " read " on Malham Moor."
p. 221, line 22, for " (Salter) " read " (Wilson)."
p. 221, bottom line, after " 3000 ft." insert " in Scotland."
p. 221, bottom line, after "Teesdale" insert "800 ft. in Westmorland."
p. 222, line 15 from bottom, delete the " e " in Harewood.
p. 222, line 5 from bottom, for " (Salter) " read " (Wilson)."
p. 223, line 11 from bottom, add " 61," delete " 64 " (9).
p. 223, line 3 from bottom, add " 65 " (9).
p. 225, line 23, delete " 60," add " 65."
p. 225, line 10, add " 64 " (9).
p. 225, line 3 from bottom, delete " 62 " (9).
p. 228, line 14 from bottom, delete " 60."
p. 228, line 5 from bottom, add " 60."
p. 228, delete " *Utricularia ochroleuca* Hartm."
p. 230, line 3, for " 900 ft. in England " read " 1600 ft. on Dartmoor " (5).
p. 230, line 19 from bottom, add " 69 " and delete " 69 " in the brackets.
p. 231, line 1, delete " 69."

p. 232, line 5, add " 65 " (9).
p. 232, line 7 from bottom, add " 63 " (9); remove the " 69 " to the bracketed list.
p. 236, line 3, add " 62, 65 " (9).
p. 237, line 21, add " 69 " (3).
p. 238, line 16, add " 2480 ft. on Knock Fell."
p. 240, line 19 from bottom, insert " to 1470 ft. in Salop."
p. 242, line 17, delete " 69 " from the list of exceptions (4).
p. 242, line 20 from bottom, add " 69 " (4).
p. 243, line 10, almost certainly extinct in 65 (9).
p. 245, line 14 from bottom, insert " 2400 ft. in Knock Ore Gill."
p. 246, line 5, for " Knockfell " read " Knock Fell."
p. 248, line 9, after " Northumberland " add " 1525 ft. on Kirkstone Pass."
p. 249, line 13, for " 1000 ft. in Britain " read " 1430 ft. in Salop."
p. 250, line 12 from bottom, for " 1380 ft." read " 1430 ft."
p. 252, line 15, add " 62 " (9).
p. 252, bottom line, add " 62 " (9).
p. 253, line 12 from bottom, add " 69."
p. 254, line 14 from bottom, for " 2700 ft." read " 2850 ft."
p. 255, line 6, for " 1200 ft. in England " read " 1470 ft. in Salop."
p. 256, line 9, after " Lowland " insert " to 1017 ft. in Westmorland."
p. 256, line 12, add " 69."
p. 257, line 14 from bottom, delete " 60."
p. 258, line 3 from bottom, add " 64 " (9), " 69."
p. 260, line 21, for " 2550 ft. in Yorks." substitute " 3000 ft. on Helvellyn."
p. 261, line 4 from bottom, add " 69."
p. 262, line 4 from bottom, add " 63 " (9).
p. 263, line 9, for " 1380 ft. in England " read " 1470 ft. in Salop."
p. 263, line 18, after " Lowland " insert " to about 1400 ft. in Merioneth (Evans)."
p. 263, line 14 from bottom, add " 69 " (4).
p. 268, line 2 from bottom, add " 63 " (9).
p. 270, line 9, delete the " 69 " from the list of exceptions.
p. 273, line 1, for " *cinerea* L." read " *atrocinerea* Brot."
p. 273, line 3, for " 1500 ft." read " 1960 ft."
p. 276, line 4 from bottom, add " 69 " (4).
p. 278, line 8, delete " 60, 63."
p. 278, line 13 from bottom, add " 69," G. M. Brown and C. C. Foster.
p. 279, line 4, after " Scotland " insert " 1480 ft. in Teesdale."
p. 281, line 3, delete " 62 " (9), " 69."
p. 281, line 2 from bottom, add " 69;" formerly in 60, now probably extinct.
p. 283, line 10, add " 60."
p. 284, line 1, add " 61, 64 " (9).
p. 284, line 9, add " 62, 64, 65 " (9), " 69."

p. 284, line 21, add “ 60.”
p. 284, line 22, add “ 63, 64 ” (9).
p. 284, line 31, add “ 60, 63, 64.”
p. 285, line 11 from bottom, add “ 62,” G. W. Crosland (9).
p. 286, *Ophrys sphegodes* is, I fear, extinct in 50 owing to building, and v.-c. 50 should be placed in brackets.
p. 286, line 14 from bottom, ~~add “ 6.~~” I have seen it in N. Somerset du
(and see J. W. White, *Fl. Brist.*, 564, 1912).
p. 291, lines 16 and 17, delete “ 60 ” and “ 69.”
p. 291, line 27, add “ 69.”
p. 293, line 9, add “ 69 ” and delete from the bracketed list on line 10.
p. 293, line 17, after “ Lowland ” add “ to 1600 ft. in Brecon,” H. H. Knight (6).
p. 293, line 20, add “ 65 ” (9).
p. 294, line 12 from bottom, add “ 60.”
p. 294, line 3 from bottom, add “ 69.”
p. 295, line 13, for “ 1200 ft.” read “ 1400 ft.”
p. 297, line 15 from bottom, add “ 69.”
p. 297, line 5 from bottom, add “ 69.”
p. 298, line 22, add “ 63, 64 ” (9).
p. 299, line 7 from bottom, for “ 1050 ft. in Teesdale ” read “ 1175 ft. in Westmorland.”
p. 300, line 8, add “ 61 ” (9).
p. 300, line 14 from bottom, for “ 2400 ft. on Mickle Fell ” add or substitute “ 2630 ft. on Dun Fell.”
p. 300, line 7 from bottom, add “ 69,” Sprott (4).
p. 302, line 8, remove the ? from 65 and add “ 69,” Dr W. A. Sledge.
p. 302, line 8 from bottom, add “ 64 ” (9); add “ 69 ” (4).
p. 303, line 3, add “ 64 ” (9).
p. 306, line 11 from bottom, after “ Lowland ” insert “ to 1650 ft. in Salop.”
p. 308, line 23, for “ 1200 ft. in Lancashire ” substitute “ 1350 ft. in Westmorland.”
p. 309, line 3, after “ Derby ” add “ 1650 ft. in Salop.”
p. 310, line 15 from bottom, transfer “61, 65” to the bracketed list (9).
p. 310, line 4 from bottom, transfer “ 69 ” to the bracketed list (4).
p. 312, line 3, reported from Hunder Moss, Balderdale, 65, by Prof. Lewis, 1903 (9).
p. 312, line 5 from bottom, add “ 63 ” (9).
p. 313, line 4, for “ 3000 ft.” read “ 3350 ft.,” A. Bennett, *Journ. Bot.*, 1907.
p. 313, line 24, for “ Llwygy ” read “ Lligwy.”
p. 314, line 14, add “ 63, 64 ” (9).
p. 314, line 25, add “ 64, 65 ” (9).
p. 315, line 8, delete “ 62 ” (9).
p. 315, line 20, delete “ 61 ” from the exceptions (9).
p. 315, line 8 from bottom, transfer “ 61 ” to brackets list (9).

p. 316, line 12, add " 65 " (9).
p. 316, line 22, for " Crunnock " read " Crummock."
p. 317, line 13, add " 61, 63-65 " (9); add " 69," Pearsall, *B.E.C. Rep.*, 1929.
p. 317, line 24, some mistake here (transfer " 69 " to the previous line).
p. 317, line 16 from bottom, add " 62-64 " (9).
p. 317, line 8 from bottom, I think " 69 " should be added to the exceptions; I know of no record.
p. 318, line 14 from bottom, add " 61 " (9).
p. 321, line 21, for " 1250 ft. in England " read " 1520 ft. in Westmorland."
p. 321, line 12 from bottom, add " 69."
p. 322, line 10, add " 69."
p. 322, line 20, add " 61 " (9).
p. 323, line 13 from bottom, for " 2700 ft. in England and Wales " read " 3050 ft. in England and 2700 ft. in Wales."
p. 324, line 17 from bottom, for " 1650 ft." read " 1920 ft."
p. 325, line 6 from bottom, delete " 60."
p. 326, line 4, for " 3500 ft. in Scotland (Hooker) " read " 3600 ft. (Trail), *Annals of Scot. Nat. Hist.*, 1909."
p. 326, line 15, extinct in " 65 " (9).
p. 327, line 17, delete " 61 " (9).
p. 328, line 5, delete " 61 " (9).
p. 328, bottom line, add " 69."
p. 330, line 7, omit " 60."
p. 331, line 2, add " 62, 63, 65 " (9); add " 69 " (4).
p. 331, line 20 from bottom, add " 69 " (4).
p. 332, line 7, add " 60."
p. 333, line 4, add " 69."
p. 333, line 15, add " 62 " (9).
p. 335, line 13 from bottom, delete " 60 " from list of exceptions.
p. 336, line 15 from bottom, for " 3000 ft." read " 3520 ft.," Marshall, *Watson Bot. Ex. Club. Rep.*, 1907.
p. 338, line 23, for " 2250 ft. in Teesdale " read " 2450 ft. in Westmorland."
p. 339, line 2, delete " 61, (62), 63 " (9).
p. 339, line 10, for " 1900 ft." read " 3300 ft.," *Watson Bot. Ex. Club Rep.*, 1907.
p. 340, line 19, add " 61 " (9).
p. 341, line 12, for "1200 ft. in England" read "1550 ft. in Devon" (5)
p. 341, line 16, add " 60."
p. 341, line 9 from bottom, add " 60, 61 " (9).
p. 342, line 20, delete " 62 " (9).
p. 347, line 6 from bottom, for " (Wilson) " read " (Baker) " (1).
p. 348, line 16, delete " 69 " from the exceptions.
p. 349, line 14, add " 69 " (4).

p. 350, line 22, for “1000 ft. in Somerset” read “2000 ft. on Dartmoor” (5).
p. 352, line 2 from bottom, add “61” (9).
p. 355, line 3, for “2900 ft. on Cross Fell” add or substitute “3020 ft. on Helvellyn.”
p. 356, line 18, for “1500 ft.” read “1800 ft.”
p. 356, line 22, add “69.”
p. 357, line 17 from bottom, insert “1550 ft. in Salop.”
p. 358, line 14, for “1800 ft.” read “1900 ft.”
p. 358, line 12 from bottom, add “69.”
p. 360, line 7, for “1650 ft.” read “1800 ft.”
p. 363, line 3, add “69” (4).
p. 363, line 3 from bottom, delete “69” from the list of exceptions.
p. 364, line 15, add “69” (4).
p. 365, line 16, add “62” (9).
p. 365, line 16 from bottom, add “61” (9).
p. 366, line 13 from bottom, for “1000 ft. in Ribblesdale” read “1200 ft. in Westmorland.”
p. 370, line 6, add “69” (4).
p. 370, line 19 from bottom, delete “69” from the list of exceptions.
p. 371, line 13 from bottom, add “61, 62” (9).
p. 374, line 21, for “3000 ft.” read “3100 ft.”
p. 375, line 18, add “69.”
p. 378, line 26, add “61” (9).
p. 379, line 18 from bottom, add “1900 ft. on Helvellyn.”
p. 380, line 11 from bottom, for “1800 ft. in W. Yorks.” substitute “2440 ft. in Westmorland.”
p. 380, line 2 from bottom, for “2480 ft. in Westmorland” substitute 2700 ft. on Helvellyn.”
p. 380, line 16, add “62” (9).
p. 382, line 3, delete “60, 64” and add “69.”
p. 383, line 22, add “2700 ft. in England.”
p. 384, line 15, add “3000 ft. in England.”
p. 384, line 3 from bottom, I think the 59 is an error.
p. 385, line 14 from bottom, delete “61” (9).
p. 386, line 3, for “400-1200 ft.” read “100-2000 ft. in Westmorland.”
p. 386, line 18, for “found it Wales” read “found in Wales.”
p. 387, line 4, for “25-2400 ft.” read “15-2450 ft.”
p. 387, line 19, add “62” (9).
p. 389, line 6 from bottom, for “20-1000 ft. in the Lake District and Dublin” read “1850 ft. in Teesdale; 1000 ft. in Dublin.”
p. 390, line 21, delete “63, 64” (9).
p. 391, line 3 from bottom, delete “64” (9).
p. 392, line 23, for “on top of Helvellyn” read “3000 ft. on Helvellyn.”
p. 392, line 18 from bottom, delete “61” (9).

p. 393, line 20, after "Lowland" add "1750 ft. on Cader Idris (Evans)" (6).

p. 393, line 23, add " 48."

p. 393, line 4 from bottom, add " 69," J. A. Martindale (4).

p. 396, line 10 from bottom, add " 60;" add " 65 " (9).

p. 397, line 9, add " 65 " (9).

p. 397, line 11 from bottom, add " 64 " (9).

p. 397, line 4 from bottom, add " 61 " (9).

p. 398, line 16 from bottom, add " 69 " (4).

p. 398, line 10 from bottom, after " Lowland " add " 1200 ft. on Penmaenmawr (F. Talfourd Jones) teste Bot. Dept., Nat. Museum of Wales."

p. 398, line 8 from bottom, add " 49."

p. 398, line 7 from bottom, add " 64 " (9).

ADDITIONS AND CORRECTIONS TO COMITAL FLORA, FOR DEVON VICE-COUNTIES 3 AND 4.

EDWARD C. WALLACE.

The publication of the new *Flora of Devon* in 1939 has necessitated a considerable number of additions and corrections to the *Comital Flora* which are brought together below for convenience. The revision of several critical genera at present being undertaken is the reason for my not including *Rubus*, *Rosa*, *Sorbus*, *Hieracium*, *Euphrasia* or *Thymus*.

Note.—The prefix † indicates an introduced or adventive species; * indicates a new vice-county record.

2/1. *Thalictrum flavum* L. Add 3 (remove from brackets), queried in *Top. Bot.*

6/6. *Ranunculus Lingua* L. Bracket 3, either long extinct or record erroneous.

6/22. *R. trichophyllus* Chaix. Delete 4.

6/24. *R. heterophyllus* Weber. Add *4.

6/26. *R. pseudo-fluitans* (Syme) Newbould ex Baker et Foggitt. Add *3 and *4.

9/1b. *Helleborus viridis* L. var. *occidentalis* (Reut.) Druce. Add 3 and *4.

†9/2. *H. foetidus* L. Add and bracket 4.

14/1. *Aconitum anglicum* Stapf. Remove brackets from 3 and 4.

19/1. *Nuphar lutea* (L.) Sm. Add *4, status doubtful.

20/1. *Nymphaea alba* L. Add *4, query status.

21/4. *Papaver Lecoqii* Lamotte. Add *3 and *4.

35/2. *Rorippa sylvestris* (L.) Besser. Add *4.

†36/2. *Barbarea verna* (L.) Asch. Add *4.

†36/5. *B. intermedia* Bor. Add *4.

37/1. *Arabis hirsuta* (L.) Scop. Add *4.

†37/6. *A. glabra* (L.) Bernh. Add and bracket *3 and *4.

†39/7. *Cardamine bulbifera* (L.) Crantz. Bracket 3 and add 4 in brackets.

44/1. *Erophila verna* (L.) E. Meyer. Add 3 and 4.

44/2. *E. Boerhaavii* (Van Hall) Dum. Add *4.

50/1. *Erysimum cheiranthoides* L. Add *4.

54/5. *Brassicella monensis* (L.) O. E. Schulz. The record for 4, *Journ. Bot.*, *74*, 326, seems overlooked.

†54/6. *B. Cheiranthos* (Vill.) Pugsl. Add *3.

†54/22. *Brassica incana* (L.) F. Schultz. Add and bracket *3.

55/1. *Diplotaxis tenuifolia* (L.) DC. Add *4.

†61/2. *Lepidium latifolium* L. Add and bracket *4.

†61/4. *L. ruderale* L. Add *4.

†64/3. *Thlaspi alpestre* L. Add and bracket 3.

†65/1. *Iberis amara* L. Add and bracket *4.

66/1. *Teesdalia nudicaulis* (L.) R. Br. Add *4.

67/1. *Hutchinsia petraea* (L.) R. Br. Bracket 3 and 4, the former probable error and *Top. Bot.* makes no reference to 4.

80/2. *Raphanus maritimus* Sm. Add *4.

87/2. *Helianthemum Chamaecistus* Mill. Add *4.

88/10. *Viola calcarea* (Bab.) Greg. Add *4.

88/19. *V. Lejeunei* Jord. Add *4.

88/20. *V. Lloydii* Jord. Add *3 and *4.

88/25. *V. latifolia* Drabble. Add *3.

88/30. *V. derelicta* Jord. Add *4.

88/31. *V. lepida* Jord. Add *3.

88/34. *V. Curtisii* Forst. Delete 3, and also delete 3, *V. lutea* Huds.

92/2. *Dianthus deltoides* L. Bracket 3.

100/2. *Cerastium arvense* L. Add *4.

†102/8. *Arenaria tenuifolia* L. Bracket 3.

103/9. *Sagina Reuteri* Boiss. Add *4 with query.

†108/2. *Claytonia perfoliata* Donn. Add *3.

112/8. *Hypericum hirsutum* L. Bracket 4.

115/1. *Althaea officinalis* L. Add and bracket 4, very doubtful.

†115/2. *A. hirsuta* L. Add and bracket 3.

†117/4. *Malva rotundifolia* L. Add *4.

123/1. *Tilia platyphyllos* Scop. Add and bracket *3 and *4.

123/3. *T. cordata* Mill. Add *4, query status.

127/1. *Geranium sanguineum* L. Add *4.

127/4. *G. pratense* L. Add *4.

†127/5. *G. phaeum* L. Add *4.

127/7. *G. pyrenaicum* Burm. fil. Add *4.

127/11. *G. rotundifolium* L. Add *4.

†132/3. *Oxalis stricta* L. Add *3.

†133/1. *Impatiens Noli-tangere* L. Add and bracket *3.

†133/3. *I. parviflora* DC. Delete 3 and 4.

138/2. *Rhamnus catharticus* L. Bracket 3.

147/3. *Genista tinctoria* L. Add 3 and 4. (Queried in *Top. Bot.*)

151/3 *Ononis spinosa* L. Bracket 4.

152/1. *Trigonella ornithopodioides* DC. Add *4.

153/4. *Medicago hispida* Gaertn. var. *denticulata* (Willd.) G. & G. Add *4.

†154/3. *Melilotus officinalis* Lam. Add *4.

155/3. *Trifolium ochroleucon* Huds. Delete 3.

155/5. *T. Molinerii* Balb. Add and bracket *3.

†155/19. *T. agrarium* L. Add *4.

166/1. *Astragalus glycyphyllos* L. Add *4.

†173/1. *Onobrychis viciifolia* Scop. Add and bracket 4.

176/7. *Vicia bithynica* L. Add *4.

176/9. *V. lutea* L. Delete 4.

†176/10. *V. hybrida* L. Add and bracket *4.
†176/14. *V. lathyroides* L. Add and bracket *4.
†178/1. *Lathyrus latifolius* L. Add *3 and *4.
†178/7. *L. hirsutus* L. Add and bracket *4.
178/8. *L. Nissolia* L. Delete 4. (Queried in *Top. Bot.*)
†178/9. *L. Aphaca* L. Add *4.
†183/2. *Prunus Padus* L. Add and bracket *3 and *4.
184/12. *Spiraea Filipendula* L. Add *4.
187/2×1. *Geum rivale* L. × *urbanum* L. Remove ? for 3.
†189/11. *Potentilla norvegica* L. Add *4.
†193/2. *Poterium polygamum* Waldst. & Kit. Add *4.
195/2. *Pyrus communis* L. Add *4.
195/16. *Pyrus germanica* (L.) Hook. f. Add *4.
†196/2. *Crataegus oxyacanthoides* Thuill. Add and bracket *3.
203/1. *Chrysosplenium alternifolium* L. Add *3.
205/1. *Parnassia palustris* L. Bracket 4.
207/2. *Ribes nigrum* L. Add *3.
211/1(2). *Sedum Fabaria* Koch. Add *4.
211/4. *S. Forsterianum* Sm. Remove brackets from 3 and add *4.
†211/5. *S. sexangulare* L. Add *3.
†211/7. *S. album* L. Add *4.
†211/10. *S. dasyphyllum* L. Add *3.
214/1. *Hippuris vulgaris* L. Bracket 3.
217/3. *Callitriche palustris* L. Add *3 and *4.
217/5. *C. intermedia* Hoffm. Add *3.
220/6. *Epilobium Lamyi* F. Schultz. Add *4.
220/8. *E. roseum* Schreb. Add *4.
†245/3. *Bupleurum rotundifolium* L. Add *4.
245/5. *B. tenuissimum* L. Delete 3.
253/1. *Sium latifolium* L. Delete 3.
†257/1. *Myrrhis Odorata* (L.) Scop. Add and bracket *3 and *4.
263/1. *Foeniculum vulgare* Mill. Remove brackets from 3.
265/4. *Oenanthe pimpinelloides* L. Add *4.
269/1. *Silaus flavescens* Bernh. Add *4.
†283/2. *Caucalis daucoides* L. Add *3 and *4.
†283/8. *C. latifolia* L. Add *3 and *4.
288/2. *Viburnum Lantana* L. Add *4.
†291/5. *Lonicera Xylosteum* L. Add *4. (All records in *C.F.* save 13 and 14 should be bracketed.)
296/3. *Galium erectum* Huds. Add *4.
296/10. *G. tricorne* Stokes. Remove brackets from 3 and add *4.
†296/12. *G. Vaillantii* DC. Add *3.
301/3. *Valeriana dioica* L. Add *4.
308/1. *Scabiosa Columbaria* L. Bracket 4.
†320/3. *Erigeron canadensis* L. Add *4, but query existing now.
*324/1. *Filago spathulata* Presl. Add *3 and *4.
†327/1. *Anaphalis margaritacea* (L.) Benth. & Hook. fil. Add *4.

328/3. *Gnaphalium sylvaticum* L. Add *4.
†333/1. *Inula Helenium* L. Add *4.
333/5. *I. crithmoides* L. Add *4.
367/1. *Diotis maritima* (L.) Cass. Add and bracket *4 extinct.
†368/1. *Anthemis tinctoria* L. Add *3 and *4.
†380/2. *Petasites albus* (L.) Gaertn. Add *3.
†381/1. *Doronicum Pardalianches* L. Add *4.
†381/2. *D. plantagineum* L. Add *3.
†383/8. *Senecio viscosus* L. Add and bracket 4.
396/4. *Cirsium acaule* (L.) Weber. Add *4, query extinct.
†405/1. *Centaurea Jacea* L. Add *4.
405/11. *C. nemoralis* Jord. Add *4.
423/15. *Taraxacum palustre* (Lyons) DC. Add *4.
†425/2. *Lactuca Serriola* L. Add *3.
†435/4. *Campanula rapunculoides* L. Add *4.
†435/6. *C. persicifolia* L. Bracket 3.
436/1. *Legousia hybrida* (L.) Delarbre. Delete 4. Not in *Top. Bot.* or *Supps.*
438/3. *Vaccinium Vitis-Idaea* L. Add *4.
439/1. *Oxycoccus quadripetalus* Gilib. Add *3.
†462/1. *Cyclamen hederifolium* Ait. Add and bracket *3.
476/1. *Microcala filiformis* (L.) Hoffmanns. et Link. Delete 3, queried in *Top. Bot.*
478/2. *Centaurium littorale* (Turner) Gilmour. Delete 3 and 4
480/6. *Gentiana anglica* Pugsl. Add *3 and *4.
†486/1. *Polemonium caeruleum* L. Add and bracket *4.
497/2. *Symphytum tuberosum* L. Bracket 3.
†503/1. *Pulmonaria officinalis* L. Add and bracket *3.
†503/2. *P. longifolia* Bor. Add and bracket *3.
506/7. *Myosotis sylvatica* (Ehrh.) Hoffm. Bracket 3 and add *4 in brackets.
515/2. *Cuscuta europaea* L. Add *4.
515/4. *C. Trifolii* Bab. Add *4.
527/4. *Verbascum virgatum* Stokes. Add *4.
†527/5. *V. Blattaria* L. Add *4.
532/3. *Linaria repens* (L.) Mill. Add *4.
549/5. *Melampyrum sylvaticum* L. Delete 3.
550/4. *Orobanche major* L. Add *3, with a query.
550/8. *O. Pieridis* F. Schultz. Add and bracket *3.
558/2. *Mentha alopecuroides* Hull. Delete 3 and 4.
558/10. *M. gentilis* L. Add *4.
562/4. *Satureia sylvatica* (Bromf.) Druce. Delete 4: no ref. in *Flora* but doubtful record for 3 is given. *Top. Bot.* gives 4, Devon South (*sic*), hence entry in *C.F.*
†578/1. *Galeopsis speciosa* Mill. Add *4.
578/4. *G. Ladanum* L. Add *4.
581/4. *Lamium hybridum* Vill. Add *4.

†586/4. *Teucrium Chamaedrys* L. Add *4.

600/4. *Chenopodium hybridum* L. Delete 3.

600/5. *C. urbicum* L. Add *4.

600/6. *C. murale* L. Add *4.

†600/7. *C. opulifolium* Schrad. Delete 4.

†600/13. *C. glaucum* L. Add *3 and *4.

611/7-. *Salicornia gracillima* (Towns.) Moss, *S. Smithiana* Moss, and *S. prostrata* Pall. sec. Moss cannot be corrected in *C.F.*, which needs thorough revision in this genus.

612/1. *Suaeda fruticosa* (L.) Forsk. Delete 3.

615/1. *Polygonum dumetorum* L. Delete 3.

615/3. *P. Bistorta* L. Add *4.

615/10. *P. mite* Schrank. Add *4.

615/11. *P. minus* Huds. Add 3, virtually new to v.-c., see *Top. Bot.* for vague reference.

615/15. *P. aequale* Lindman. Add *4.

618/1. *Rumex Hydrolapathum* Huds. Delete 4. Not given for 4 in *Top. Bot.*, but 3 is given twice (*Top. Bot.* and *2nd Supp.*).

618/10. *R. rupestris* Le Gall. Bracket 4.

623/2. *Daphne Mezereum* L. Delete 3.

626/1. *Viscum album* L. Add *4.

627/1. *Thesium humifusum* DC. Delete 3.

†628/9. *Euphorbia virgata* Waldst. & Kit. Add *3.

†628/11. *E. Cyparissias* L. Add *4.

633/6. *Ulmus stricta* Lindl. Add *3.

644/1. *Carpinus Betulus* L. Add *4.

†647/1. *Castanea sativa* Mill. Add *3.

†650/1. *Salix pentandra* L. Add and bracket *4.

†651/3. *Populus nigra* L. Add *3 and *4.

653/2. *Ceratophyllum demersum* L. Add *4.

659/1. *Hammarbya paludosa* (L.) O. Kuntze. Add *3.

667/3. *Cephalanthera longifolia* (Huds.) Fritsch. Add *3.

668/4. *Epipactis purpurata* Sm. Add *4.

668/5. *E. atropurpurea* Rafin. Delete 3 and 4.

674/1. *Gymnadenia conopsea* (L.) R. Br. Add *4.

†678/2. *Crocus officinalis* Huds. Add *3.

681/1. *Gladiolus illyricus* Koch. Delete 3.

†684/3. *Narcissus biflorus* Curt. Add *4.

686/2. *Leucojum aestivum* L. Remove brackets from 3, and add *4 in brackets.

†702/1. *Allium Ampeloprasum* L. Add and bracket *3.

†702/3. *A. Scorodoprasum* L. Add and bracket *4.

†702/7. *A. triquetrum* L. Add *4.

†703/1. *Muscari racemosum* (L.) DC. Add and bracket *4.

707/1. *Ornithogalum pyrenaicum* L. Bracket 3.

†707/2. *O. umbellatum* L. Add *4.

†708/2. *Lilium pyrenaicum* Gouan. Add *3.

713/1. *Colchicum autumnale* L. Remove brackets from 3, and add and bracket 4.

718/8. *Juncus subnodulosus* Schrank. Add *4.

718/14. *J. compressus* Jacq. Add *3 and *4.

†719/9. *Luzula luzuloides* (Lam.) Dandy et Wilmott. Add *4.

721/2. *Typha angustifolia* L. Add *4.

722/1. *Sparganium neglectum* Beeby. Add 4, but see *Top. Bot. 1st Supp.* for previous record.

723/1(2). *Arum neglectum* (Towns.) Ridl. Add *5 (p. 634).

727/3. *Lemna trisulca* L. Add *4.

727/4. *L. gibba* L. Add *4.

732/1. *Sagittaria sagittifolia* L. Add *4.

737/9. *Potamogeton gramineus* L. Delete 4.

737/11. ×*P. nitens* Weber. Add *4.

737/13. *P. lucens* L. Bracket 3 and add 4 in brackets.

737/25. *P. pusillus* L. Add *3 and *4.

739/2. *Zannichellia pedicellata* Fr. Add *4.

†744/1. *Cyperus longus* L. Add and bracket *3.

745/4. *Eleocharis acicularis* (L.) Roem. et Schult. Add *4.

746/14. *Scirpus compressus* (L.) Pers. Add *3.

747/1. *Eriophorum latifolium* Hoppe. Remove query for 4.

748/1. *Rhynchospora fusca* (L.) Ait. f. Delete 4. 3 already added (*B.E.C. Rep. 1928*, 763 (1929)).

748/2. *R. alba* (L.) Vahl. Add *4.

753/1. *Carex Pseudo-cyperus* L. Add *4.

753/8. *C. lasiocarpa* Ehrh. Bracket 3.

753/25. *C. digitata* L. Delete 3.

753/38. *C. limosa* L. Add and bracket *3.

753/57×59. ×*C. axillaris* Good. Add 3.

753/58. *C. canescens* L. Add and bracket 3 and 4. (*Top. Bot.* gives 3, Devon S. ?).

753/63×57. ×*C. Boenninghauseniana* Weihe. Add *3.

753/65. *C. diandra* Schrank. Bracket 3; 4 very doubtful.

753/66. *C. disticha* Huds. Add *4.

753/68. *C. divisa* Huds. Delete 4. Given for 4 in *Top. Bot.* without personal authority.

753/75. *C. dioica* L. Delete 4.

†754/10. *Panicum sanguinale* L. Add *3.

†756/2. *Setaria viridis* (L.) Beauv. Add *4.

770/6. *Alopecurus aequalis* Sobol. Delete 3.

†780/1. *Agrostis semiverticillata* (Forsk.) C. Chr. Add *3.

794/3. *Avena pratensis* L. Delete 4. *Top. Bot.* gives 4.

†808/1. *Cynosurus echinatus* L. Delete 4.

809/1. *Koeleria gracilis* Pers. Delete 4.

818/1. *Melica nutans* L. Delete 3.

825/1. *Glyceria maxima* (Hartm.) Holmb. Add *4.

825/3(2). *G. declinata* Bréb. Add *3.
826/6. *Festuca heterophylla* Lam. Add *3.
826/18. *Festuca myuros* L. Add *4.
827/7. *Bromus erectus* Huds. Add *4.
827/20. *B. molliformis* Lloyd. Add *3 and *4.
†827/22. *B. arvensis* L. Add *4.
†829/2. *Lolium temulentum* L. Add *4.
†829/3. *L. remotum* Schrank. Add *3.
844/3. *Equisetum sylvaticum* L. Delete 4. (Queried in *Top. Bot.*).
851/4. *Asplenium lanceolatum* Huds. Remove brackets from 4.
856/8. *Dryopteris Thelypteris* (L.) A. Gray. Remove brackets from 3, add *4.
863/2. *Hymenophyllum peltatum* (Poir.) Desv. Add *4.
870/1. *Lycopodium alpinum* L. Add and bracket *3.
872/3. *Nitella flexilis* Agardh. Add *3 and *4.
872/5. *N. translucens* (Pers.) Agardh. Add *4.
876/5. *Chara hispida* L. Bracket 3 and delete 4.
876/12. *C. aspera* Willd. Add *4.

NOTES ON THE FLORA OF BUXTON AND DISTRICT.

F. T. and R. H. Hall.

The following records of the more uncommon plants of Buxton and neighbourhood are, for the most part, supplementary to the *Flora of Derbyshire* (Rev. W. R. Linton, 1903) and Dr Eric and H. Drabble's "Notes on the Flora of Derbyshire," *Journ. Bot.*, 1909, 1911, 1913, 1916; also *Journ. Derbyshire Archaeological and Nat. Hist. Soc.*, 1917, 1926-7.

Voucher specimens, with a few exceptions, are in the private herbarium of the authors.

In cases where it was deemed advisable not to gather specimens owing to the great local rarity of the species, photographs of the plants (*in situ*) are available.

The vice-county is No. 57, unless otherwise recorded.

Where a plant still flourishes at an old station, it is re-recorded with due acknowledgment to the original recorder.

RANUNCULACEAE.

2/2. Thalictrum minus L. "Priestcliffe Lees, near Miller's Dale" (W. H. Painter, contribution *Flora Derbyshire*, 1889). Still well established but confined to a belt about the 1000 ft. line.

Burfoot, Miller's Dale; abundant. Water-cum-Jolly, a few plants; probably an extension from the hill (Burfoot) above.

6/4. Ranunculus auricomus L. Ashwood Dale; Chee Dale; Monks Dale (Limestone).

6/11. [R. sceleratus L. Not seen in this part of the county.]

6/22. R. trichophyllus Chaix. Monk's Dale—in stream at several points but not plentiful. Thickly incrusted with mineral salts. Lathkill Dale—a little.

6/31. R. Lenormandi F. Schultz. Mam Gap, Edale. Moss Carr, near Hollinsclough (v.-c. 39).

6/32. R. hederaceus L. Have not met with it on limestone. The following records are on gritstone: Black Edge, Fairfield, Doves Holes. Brand Top—in many places. Washgate Valley.

6/33. R. Ficaria L. The form producing bulbils in axils of leaves is common in damp shady places. Where the plant grows in more open situations seed is produced. No specimens have yet been met with producing both bulbils and seed at the same time.

8/1. Trollius europaeus L. Recorded by Rev. W. Moyle Rogers in *Journ. Bot.*, 1885, for "Rocks near Lover's Leap (Buxton); and near the top of the hill opposite the railway station, Miller's Dale." At each of these stations the plant is still vigorous.

Limestone bank, Dale Road, Buxton. Grin Plantation. Cowdale. Cunning Dale. Most abundant on Topley Pike; also above Chee Tor. Still found in Monk's Dale, as recorded by West, *Journ. Bot.*, 1884. Isolated clumps are met with in many places on the limestone uplands at about the 1000 ft. line. It appears to have increased somewhat since the publication of Linton's Flora in 1903.

9/1. HELLEBORUS VIRIDIS L. var. OCCIDENTALIS (Reut.) Druce. Recorded by Miss Hawkins (1854) for Cunning Dale (vide Dr Robertson's Buxton Guide). Still there. An extensive patch in Grin Plantation, Buxton, at east end at about 1150 ft. Flagg Dale.

9/2. [H. FOETIDUS L. Appears to be absent from this part of the county.]

11/1. AQUILEGIA VULGARIS L. Rev. W. Moyle Rogers recorded *A. vulgaris* with *Trollius* " near top of hill above Miller's Dale station " in *Journ. Bot.*, 1885. Both plants are still found at this station, which is limestone and reaches to 900 ft. White-flowering specimens of *Aquilegia* are frequent intermixed with the type; while *Gymnadenia conopsea*, *Hypericum pulchrum*, and *Helianthemum Chamaecistus* are associates.

FUMARIACEAE.

†31/4. CORYDALIS LUTEA (L.) DC. Frequent on walls—but probably planted—at Over Haddon, near Bakewell. The lower walls of Throwley Old Hall—now in ruins—are richly ornamented with *Corydalis*, producing a very pleasing effect (v.-c. 39).

CRUCIFERAE.

35/2. RORIPPA SYLVESTRIS (L.) Besser. Buxworth Canal.

35/4. R. ISLANDICA (Oeder) Schinz et Thell. Water-cum-Jolly.

37/1. ARABIS HIRSUTA (L.) Scop. Very abundant on limestone rocks and cliffs. Ashwood Dale; Deepdale; Chee Dale; Burfoot, Miller's Dale.

39/2. CARDAMINE AMARA L. By River Dove at Hollinsclough, on Derbyshire side. Dove Dale—common. Miller's Dale.

39/3. C. IMPATIENS L. Blackwell Dale; Water-cum-Jolly, by the path near River Wye. Locally plentiful in Lathkill Dale. Dovedale.

43/3. DRABA INCANA L. The locality Lover's Leap in *Fl. D.* needs bracketing, the plant not having been seen of recent years. Abundant on the slopes of Burfoot (Highfield), Miller's Dale; near the entrance to the small cavern. Associated, at this point, with *Arabis hirsuta*, *Arenaria verna*, *Thalictrum minus*, and *Solidago Virgaurea*. Water-cum-Jolly—a little, probably escaped from hill above.

43/4. D. MURALIS L. In *Flora of Derbyshire* Linton states *D. muralis* is plentiful. We have only seen it plentiful in Ricklow Dale and this during the summer of 1939. Small patches have been observed in Deep Dale, Buxton; Blackwell Dale; Monsal Dale; Taddington Dale.

†47/2. HESPERIS MATRONALIS L. Well established—on limestone and millstone grit—in many places about Buxton. Grin Plantation—a little. Pictor Wood, Ashwood Dale; abundant on railway embankment near Pictor railway tunnel. Miller's Dale. On gritstone, Gadley Lane, Buxton.

†49/3. SISYMBRIUM ALTISSIMUM L. By river Wye, Ashwood Dale, on waste ground.

†61/3. LEPIDIUM DRABA L. Railway bank north of Miller's Dale railway station.

64/4. THLASPI CALAMINARE Lej. & Court. (*T. virens* Jord.) The very rare *T. virens* in Derbyshire grows only in the neighbourhood of old lead-mines on the Carboniferous Limestone. Although it has not yet been met with in the "High Peak" district, there does not appear any obvious reason why it should not exist; especially when one recalls that there are numerous disused lead-mine workings about Miller's Dale, Great Longstone, etc.

67/1. HUTCHINSIA PETRAEA (L.) R. Br. Not at all common in the district: just manages to perpetuate itself. The station under Monsal Dale railway viaduct was almost obliterated during 1938 owing to structural alterations. During these alterations a large quantity of rubble was tipped down the embankment. In spite of this several plants were observed in bloom in the spring of 1939.

Miller's Dale—one plant on rock shelf. Pictor, Ashwood Dale; about half a dozen plants.

RESEDACEAE.

85/2. RESEDA LUTEA L. Near Friden Brick Works, on waste ground; also a little by High Peak railway track between Friden and Parsley Hay.

VIOLACEAE.

88/33. VIOLA LUTEA Huds. Often in great abundance on the limestone uplands and grassy slopes of the dales. Much less frequent on the gritstone.

Grin Low, Buxton; Hill opposite Millers Dale railway station. Priestcliffe Lees. Burfoot, Miller's Dale; an extensive patch with *Arenaria verna* as dominant. Monsal Dale. Meadows above Cressbrook Dale. Ravensdale and Tansley Dale. Chelmorton Low, most abundant. Ricklow and Lathkill Dales. At Brand Top, near Buxton; along with var. *amoena* Hensl. which is here abundant. (Gritstone).

CARYOPHYLLACEAE.

92/2. DIANTHUS DELTOIDES L. On rock escarpment in Bradford Dale (F. Crosland).

96/10. SILENE NUTANS L. Frequently met with in the limestone dales; when found it is usually abundant.

Limestone rocks above Ashwood Dale. On the north bank of the dale, between Miller's Dale and Litton Mill, there was a remarkably fine floral display during the first week in July of 1939. One large clump was even established on the limestone wall, skirting the River Wye, and overhanging the river.

Deepdale, Buxton. Monk's Dale—plentiful on east ridge. Dovedale—record in *Fl. D.* confirmed.

102/1. ARENARIA TRINERVIA L. Deepdale; Cressbrook Dale. Dovedale—near the Dove Holes.

102/10. ARENARIA VERNA L. A strictly local plant found in great profusion on broken ground in the vicinity of old lead mines. Lead-wort—a local name—seems most appropriate. (In Yorkshire the name Lead-wort refers, I believe, to *Thlaspi alpestre*.)

Burfoot, Miller's Dale; the dominant plant, at certain points, where it is associated with—*Thalictrum minus, Draba incana, Viola lutea*, and *Saxifraga platypetala*.

Priestcliffe—at 1000 ft. Tideswell Dale, a little. Water-cum-Jolly, a little. Ravensdale and Tansley Dale—growing on heaps of calcite. Lathkill Dale—a little, near the old stone pylons.

103/7. SAGINA CILIATA Fr. Plentiful on "The Slopes," Buxton; petals absent.

PORTULACEAE.

108/1. CLAYTONIA ALSINOIDES Sims. Corbar Wood, Buxton.

HYPERICACEAE.

112/7. HYPERICUM MONTANUM L. Duke's Drive, Buxton (Rogers, *Journ. Bot.*, 1885). Still there, growing on limestone rock. Wooded area, Ashwood Dale, opposite Lover's Leap. Cunning Dale, with *H. pulchrum, Helianthemum Chamaecistus* and *Campanula glomerata*.

112/9. H. PULCHRUM L. Frequent both on limestone and gritstone. Limestone—Cunning Dale; Miller's Dale—hill overlooking railway station. Ravensdale.

Gritstone—Cavendish Golf Links, Buxton. Washgate; Hollinsclough; Goyt Valley; Malcoff, near Chapel-en-le-Frith. Cracken Edge, Chinley.

112/11. H. QUADRANGULUM L. On limestone in Ashwood Dale, by spring rising from bank-side opposite Pictor tunnel. Also Chee Dale; Monk's Dale; Lathkill Dale; Mill Dale; Dovedale.

In ditch, by main road, Hassop to Rowland.

Gritstone—By stream, Cavendish Golf Links, Buxton.

112/12. H. DUBIUM Leers. Linton questions the nativity of this species in v.-c. 57; there being only two antiquated and unreliable records available when the *Flora of Derbyshire* was issued.

During Aug. 1935 several plants were located on a gritstone bank at Combs, near Chapel-en-le-Frith. Specimens submitted to Mr A. R. S. Proctor, F.L.S., Duffield, received confirmation of determination. Several visits have been made to this station since discovering the plant but, while still there, it does not appear to make any progress.

112/15. H. HUMIFUSUM L. Very uncommon in Buxton neighbourhood. Jewitt's record for Ashwood Dale (1811) is now unreliable, we fear, as we fail to find any trace of the plant in this dale.

Cavendish Golf Links—on shaly bank overlooking the stream.

112/17. H. ELODES L. Has not been met with, although conditions appear highly suitable in many places on Millstone Grit.

MALVACEAE.

117/1. MALVA MOSCHATA L. On limestone in Monk's Dale; Ricklow Dale; Lathkill Dale.

GERANIACEAE.

127/1. GERANIUM SANGUINEUM L. Met with in almost all the limestone dales in the neighbourhood. The records in *Fl. D.* (Linton) for Miller's Dale, Chee Dale, Monk's Dale, Monsal Dale, Cressbrook Dale, and Deep Dale, are all confirmed by present writers.

Additional records:—Limestone rocks above railway, Ashwood Dale. Wooded area above Chee Tor. Topley Pike. Demon's Dale. On the National Trust Property, Taddington Wood, in the less wooded area, the screes, and the open ground above the wood.

At Ravensdale *G. sanguineum* is abundant. We note, however, that during August of most years the plant is badly galled by *Eriophyes geranii.*

†127/5. G. PHAEUM L. New Smithy, Chinley; probably a garden escape, but well established. Stubbins Lane, Chinley; well removed from any dwelling.

127/7. G. PYRENAICUM Burm. fil. Cowdale, near Buxton; abundant in several places.

127/8. G. COLUMBINUM L. Miller's Dale (Cont. *Fl. D.*, Painter, 1889). Still met with but in small quantity.

127/9. G. DISSECTUM L. Miller's Dale.

127/13. G. LUCIDUM L. Abundant, but local. Cowdale; Cunning Dale.

RHAMNACEAE.

138/2. RHAMNUS CATHARTICUS L. At about 950 ft. on limestone rocks above railway, Ashwood Dale. Chee Dale, occasional. Wooded area above Chee Tor, abundant. Taddington Wood.

LEGUMINOSAE.

147/1. GENISTA ANGLICA L. Must be regarded as rare in this district. Heathy ground west of Thirkelow rocks, near Buxton.

147/3. G. TINCTORIA L. Appears to be absent from this part of Derbyshire.

151/2. ONONIS REPENS L. Local. Limestone rocks above Ashwood Dale at 950 ft. By roadside between Miller's Dale and Tideswell. Abundant in a lane between Monk's Dale and Tideswell.

†154/3. MELILOTUS OFFICINALIS Lam. Occurred as a casual at Great Rocks Dale, and Hindlow, near Buxton, in 1933. Not observed since. Tideswell Dale—several plants Aug. 1939.

155/22. TRIFOLIUM FILIFORME L. On limestone rocks at Blackwell Mill. Above Chee Tor.

172/1. HIPPOCREPIS COMOSA L. Blackwell Mill, on rocky limestone slopes, in several places. Must be regarded as rare in this part of Derbyshire.

ROSACEAE.

183/2. PRUNUS PADUS L. Common on the limestone cliffs above Ashwood Dale. Several very fine trees by the River Dove, on the Derbyshire side, between Glutton and Hollinsclough.

184/12. SPIRAEA FILIPENDULA L. Strictly local and not abundant at any of the stations. The records in *Fl. D.* for Cressbrook and Tansley Dales are confirmed.

Tideswell Dale, scattered sparsely on the bankside for some distance. Basalt outcrop, near Litton turning, Tideswell.

185/154. Rubus saxatilis L. Local and somewhat rare.

Miller's Dale, limestone hill opposite railway station, at a little under 950 ft. Monk's Dale, abundant on the east bank, towards the head of dale. Ravensdale, abundant on rough stony slope.

185/155. R. Chamaemorus L. Locally plentiful on moors near Cat and Fiddle Inn, at about 1750 ft. Although both stameniferous and pistiliferous plants grow together, fruit is seldom, if ever, produced.

The following note from the *North Staffs. Field Club Report* for 1886 is of interest (Mr R. Garner, the Staffordshire botanist was the speaker): "This plant, an inhabitant of the high moors on Axe Edge, near where Staffordshire, Derbyshire, and Cheshire meet, we never found but once. The specimens before you were gathered by one of us forty-five years back, and we fear it may, ere this, have disappeared from that locality." After almost a century of observed growth it is still abundant.

186/1. Dryas octopetala L. Jewitt's record (1811) for " near Ashwood Dale " appears to be unreliable now, the plant not having been seen of recent years.

189/6. Potentilla verna L. Topley Pike, one clump on edge of cliff overlooking Deep Dale; also a number of small patches on bankside sloping into Deep Dale. Pictor, Ashwood Dale; an extensive patch. Miller's Dale, in several places. Abundant along the eastern ridge of Ravensdale.

193/1. Poterium Sanguisorba L. Grassy rock shelves, above railway, Ashwood Dale. Head of Lover's Leap, Buxton. Plentiful in Grin Plantation on grassy banks.

193/4. P. officinale (L.) A. Gray. "Lover's Leap, Buxton" (Painter, 1889). Still there. Grin Plantation, Buxton. Above Ashwood Dale on east side. Locally abundant in meadow by River Dove, between Glutton Bridge and Hollinsclough.

SAXIFRAGACEAE.

199/10. S. hypnoides L. Frequent on limestone at Cowdale, Thirkelow Rocks, near Buxton; and Ricklow Dale.

203/1. Chrysosplenium alternifolium L. Very uncommon. Near Lover's Leap, Ashwood Dale. Cowdale, a little. Chee Dale. Very fine specimens at Demon's Dale near Taddington Dale.

205/1. PARNASSIA PALUSTRIS L. *Parnassia* appears to be extending its range on the limestone very considerably. This is probably due to two factors. Leaching of the soil has undoubtedly taken place in many localities to a considerable degree. Evidence of this is provided by the appearance of calcifuge mosses on the limestone, together with areas thinly carpeted with *Calluna vulgaris*, *Vaccinium Myrtillus*, and, less frequently, *V. Vitis-Idaea*. It would appear that the gradual changing of the soil from " basic " to " acidic " has resulted in the extended distribution of *Parnassia*. But probably the most important factor governing the local increase of the plant is the cessation of the vandalism prevalent in Buxton neighbourhood 40-50 years ago, when small clumps were potted and sold to visitors.

Most abundant on the grass-covered lime-ash banks, Grin Plantation, Buxton. By roadside between Harpur Hill and Ladmanlow. On grass verge at Brierlow Bar. Well established in meadow between Brierlow Bar and Chelmorton.

Plentiful on banks near railway viaduct, Duke's Drive, Buxton. Cunning Dale. Railway embankment, Ashwood Dale, near Topley Pike; where it is associated with *Helianthemum Chamaecistus*, *Scabiosa Columbaria*, *Listera ovata*, and *Coeloglossum viride*.

Roadside between Heathfield Nook and Kingsterndale. Monk's Dale, in several places, but not abundant. Flagg Dale. Priestcliffe Lees. Ravensdale. Taddington Dale.

207/5. RIBES ALPINUM L. Although widely distributed in the limestone dales, it is not really plentiful.

Cowdale plantation, one tree. A small clump of stamen-bearing trees at Kingsterndale. At the junction of Chee Dale and Flagg Dale the stameniferous and pistiliferous trees grow in close proximity. To the rear of Miller's Dale Church and on the edge of the cliff overlooking Monk's Dale both types are found. Fruit is plentiful. Dovedale, near refreshment hut, on both sides of the river (v.-cc. 57 and 39). Washgate Valley, two trees on gritstone.

CRASSULACEAE.

211/1. SEDUM TELEPHIUM L., em. Gren. & Godr. (*S. purpureum* Link.) Local on limestone, often abundant. Most abundant on bankside at Cowdale. Plentiful in old quarry between Waterswallows (Fairfield) and Peak Dale.

Near Raven's Tor, Miller's Dale. Tideswell Dale, a little. On grassy bank near railway, under Priestcliffe Lees. Ravensdale. High Dale, Brushfield. Demon's (Dimins) Dale, near Ashford. Glutton Dale, in many places. Ricklow Dale.

DROSERACEAE.

213/3. DROSERA ROTUNDIFOLIA L. We have not met with *Drosera* in v.-c. 57. It is, however, recorded for the adjoining v.-c. 39. [Many records in W. R. Linton, *Fl. Derbysh.* —ED.]

UMBELLIFERAE.

243/1. CONIUM MACULATUM L. Was recorded for Buxton in *Flora of Derbyshire* (Waterfall), but has not been seen during recent years.

Between Conksbury Bridge (Lathkill Dale) and Alport, abundant. Between Alport and Picory Corner.

255/1. PIMPINELLA MAJOR (L.) Huds. Frequent in limestone dales. Local.

"Abundant in Ashwood Dale at Lover's Leap" (Baker, *Journ. Bot.*, 1884). Still plentiful.

Hill opposite railway station, Miller's Dale; very fine specimens. Tideswell Dale. Ravensdale, a little. Plentiful in Monk's Dale, on east slope, with *Campanula Trachelium* and *Stachys officinalis.*

Var. ROSEA (Koch) Druce. Blackwell Dale. Miller's Dale—Wood near end of Chee Tor railway tunnel; also on hill above railway station.

255/2. P. SAXIFRAGA L. Frequent on grass-covered, lime-ash banks in Grin Plantation, Buxton; associated with *Gymnadenia conopsea.* Priestcliffe Lees. Miller's Dale—Observed here by Rogers in 1884 (*Journ. Bot.*). Monk's Dale—Common on east slope, away from scrub; also on terraces above the dale.

Var. DISSECTA With. At Miller's Dale, with the type, but much more common. Monk's Dale.

Var. ROSEIFLORA Drabble. With type, Grin Plantation, Buxton.

257/1. MYRRHIS ODORATA (L.) Scop. Local. Frequently met with, in large masses, both on limestone and gritstone. Often near dwellings, but truly wild at stations well removed from human habitation.

Grin Plantation, Buxton. A tremendous mass behind Miller's Dale Church, extending into Monk's Dale. Disused I.C.I. Quarry, Miller's Dale. Priestcliffe Lees, also Priestcliffe.

On gritstone at Brand Top; Washgate; and Dale Head, near Thirkelow rocks. It is also on limestone at the last-named station.

266/1. Aethusa Cynapium L. Somewhat uncommon in the district. Waste ground, by roadway, Water-cum-Jolly; in several places.

277/2. Heracleum Sphondylium L. The pink-flowered form is frequent on limestone.

282/1. Daucus Carota L. Not met with in the locality.

CORNACEAE.

285/1. Cornus sanguinea L. Head of Lover's Leap, Buxton. Plentiful in Lathkill Dale. In hedgerow between Thorpe Cloud railway station and Peveril Hotel. The records in *Fl. D.* for Monsal and Cressbrook Dales are confirmed.

CAPRIFOLIACEAE.

†287/1. Sambucus racemosa L. Well established in disused Millstone Grit Quarry north of Buxton, where it produces an abundance of its scarlet fruit.

Ashwood Dale—one tree of many years' growth among scrub, on rocks, above railway; no habitation near; probably bird sown.

288/1. Viburnum Opulus L. Frequent, especially on limestone, up to 900 ft.

Wooded area, Ashwood Dale; probably the same station as recorded by Jewitt, 1811 (*Hist. of Buxton*).

Miller's Dale—hill opposite railway station. Above Chee Tor, Taddington Dale; and Monsal Dale.

RUBIACEAE.

296/6. Galium uliginosum L. Waterswallows, Fairfield. Brand Top.

VALERIANACEAE.

301/3. Valeriana dioica L. Grin Plantation, Buxton. Near Dale Head, Buxton. Moss Carr, near Hollinsclough (v.-c. 39).

304/4. Valerianella carinata Loisel. A little on limestone bank in Tideswell Dale.

DIPSACEAE.

306/2. Dipsacus pilosus L. Plentiful on rock shelf, Demon's Dale, near Ashford.

308/1. Scabiosa Columbaria L. Very plentiful on limestone slopes and lime-ash heaps.

Cunning Dale, Cowdale, Ashwood Dale, Topley Pike, Glutton Dale. On grass verge at Kingsterndale. White-flowered specimens are frequently met with.

308/5. S. ARVENSIS L. Frequent by the roadsides, in the lanes and dales about Tideswell, Litton, Cressbrook, and Miller's Dale.

Less frequent on Millstone Grit, but well established in a meadow above Washgate Valley (upper reaches of River Dove) where there is an annual display of very fine heads of bloom.

COMPOSITAE.

310/1. EUPATORIUM CANNABINUM L. Chee Dale, by River Wye, a little. Frequent small clumps in Monsal Dale, by river. In Lathkill Dale small clumps are found in many places; but under Over Haddon the river bed often becomes dry during the summer months—some water finding its way to a lower level—and at this point the bed is almost covered with *Eupatorium*; producing a most pleasing effect when in bloom. Also by the river at Alport.

312/1. SOLIDAGO VIRGAUREA L. Frequent on limestone screes, hedgebanks, and in the dales. Less frequent on gritstone.

Blackwell Mill, Chee Dale, Miller's Dale, especially in an old limestone quarry; Monsal Dale; Cressbrook Dale.

On gritstone at Washgate Valley.

Var. CAMBRICA Huds. Topley Pike, as recorded in *Fl. D.*; Water-cum-Jolly; and Burfoot, Miller's Dale.

326/1. ANTENNARIA DIOICA (L.) Gaertn. One large patch in Grin Plantation, Buxton, with a little in several places on grass-covered lime-ash banks; Countess Cliff, southwest of Buxton, several small patches.

†327/1. ANAPHALIS MARGARITACEA (L.) Benth. & Hook. fil. Cunning Dale on eastern ridge—one patch. Well established at Friden on railway embankment.

†333/1. INULA HELENIUM L. A few plants by roadside at Combs, Chapel-en-le-Frith; probably a garden escape.

333/4. I. CONYZA DC. Very local. Appears to be confined to one locality in this district.

Abundant in both Monsal and Cressbrook Dales. In the latter dale we noted that fasciation of the plant was very common.

334/1. PULICARIA DYSENTERICA (L.) Bernh. Extensive patch on railway embankment, Ashwood Dale, not far from Lover's Leap. Chinley.

378/1. ARTEMISIA ABSINTHIUM L. Waste ground together with *A. vulgaris* in Tideswell Dale.

†381/1. Doronicum Pardalianches L. Grin Plantation, Buxton; one very large patch. Pictor Wood, Ashwood Dale; plentiful in several places.

391/1. Carlina vulgaris L. Local. Frequent on dry limestone banks, especially where ground has been disturbed when prospecting for lead.

Grin Plantation, Buxton. Monk's Dale. Miller's Dale, Priestcliffe Lees, Burfoot, Ravensdale, Tansley Dale, Longstone Edge, Hassop old lead mines, Lathkill Dale.

395/1. Carduus nutans L. Frequent on limestone.

Miller's Dale, Monk's Dale, Cressbrook Dale, Ravensdale, Longstone Edge, Hassop (Deep Rake) Lead Mines. Ladmanlow, near Buxton. Very common in meadows above Chee Tor.

396/1. Cirsium eriophorum (L.) Scop. Linton's record for Buxton (Buxton Guide) ceases to be of value, the plant not having been met with for many years.

The record "Hassop Mines, abundant," we can confirm, the station being visited by both of us on Aug. 7th, 1939. Deep Rake Lead Mines is probably the more correct designation of this station.

396/3. C. heleniodes (L.) Hill. Particularly abundant in Buxton district, where it reaches to 1150 ft. It appears to be extending its range rather rapidly on the limestone.

The following records from *Fl. D.* are all confirmed:—Lover's Leap, Buxton; Monk's Dale, Taddington, Cressbrook Dale, Dovedale, Grin Wood, Burbage—mixed with *Parnassia* (Baker), and on gritstone at Malcoff.

Additional records:—Ashwood Dale—wooded area opposite Lover's Leap, abundant. Near Topley Pike. Cunning Dale. Harpur Hill. Miller's Dale. Fairfield.

On gritstone at Cavendish Golf Links, Buxton; and abundant in damp meadow between Glutton and Hollinsclough.

402/1. Serratula tinctoria L. Locally plentiful.

Lover's Leap, Buxton. Ashwood Dale, above railway; Cunning Dale; railway embankment, near quarry, Topley Pike.

409/1. Cichorium Intybus L. Has been observed in several places, as a casual, during recent years.

415/2. Picris hieracioides L. Ashwood Dale—wooded area opposite Lover's Leap; also bankside opposite Devonshire Arms Hotel; abundant in Old Dale, Blackwell Mill. Cressbrook Dale.

416/2. Crepis paludosa (L.) Moench. Grin Plantation, Buxton; in several places. Was observed here in 1885 by Rogers (*Journ. Bot.*).

A little by River Wye in Chee Dale. Several plants in upper reaches of River Dove (Gritstone), about half-mile from its source. (This is probably the same station as recorded by Rev. W. H. Purchas, *Journ. Bot.*, 1885; if so it should read v.-c. 39.)

416/3. C. BIENNIS L. Not yet observed by us.

CAMPANULACEAE.

432/1. JASIONE MONTANA L. Very infrequent in the locality. Not observed on limestone.

Washgate Valley—a little in many places. More plentiful on bankside near the Pack Horse Bridge.

435/1. CAMPANULA GLOMERATA L. Dale Road, Buxton; a little on bankside. Ashwood Dale, here and there among scrub above railway; plentiful at one point, near railway.

Cunning Dale—on bank opposite old lime kilns, and in meadow above. The plant is particularly well established here. Deep Dale.

435/2. C. LATIFOLIA L. Cowdale, near Buxton; plentiful. Chee Dale. Cressbrook Dale. Ravensdale.

435/3. C. TRACHELIUM L. West's record for Monk's Dale (*Journ. Bot.*, 1884) still holds good. Water-cum-Jolly—here and there. Ravensdale.

VACCINIACEAE.

438/2. VACCINIUM MYRTILLUS L. Grin Low—on limestone; with a little in Grin Plantation. Topley Pike. Above Great Rocks Dale.

Frequent on gritstone at Axe Edge, Goyt Moss, Brand Top, and Washgate Valley.

438/3. V. VITIS-IDAEA L. On limestone with *V. Myrtillus* at Grin Low, Buxton; and Topley Pike. At each of these stations growth is stunted. Still "plentiful on Axe Edge" as recorded by Baker (*Journ. Bot.*, 1884). Washgate Valley—plentiful; also moors near Cat and Fiddle Inn.

439/1. OXYCOCCUS QUADRIPETALUS Gilib. Near Stanley Moor Reservoir, Buxton. Abundant on boggy ground not far from Dove Head. Moss Carr, near Hollinsclough (v.-c. 39).

ERICACEAE.

444/1. ANDROMEDA POLIFOLIA L. Axe Edge (Garner, *Fl. D.*, confirmed by Mr J. Armitage).

453/3. PYROLA MINOR L. Only one record is given in the *Flora of Derbyshire* (Linton) for *P. minor*, this being very vague. From information received through Mr A. R. S. Proctor, Duffield, I learn that the station referred to was the hill opposite Miller's Dale railway station. For many years, until recently, the limestone was quarried at this point, resulting in the loss of the plant. W. R. Linton's record, therefore, from Painter's contribution to *Flora of Derbyshire*, needs bracketing.

During September 1932 my son and I located a new station for *P. minor* in a copse at the junction of the Cowdale and Kingsterndale roads. It is covering an area of approximately 3-4 square yards. A slight increase of area has been noted since first discovered.

MONOTROPACEAE.

456/1. MONOTROPA HYPOPITYS L. Grin Plantation, Buxton.

Information concerning the establishment of *Monotropa* in this neighbourhood was communicated to us by two lady visitors to Buxton (names unknown) in August 1935. This led to ourselves locating the plant the following year, when nine spikes were observed. During the present year a very careful search revealed that a larger area than had previously been noted was productive of flowering spikes. It is found under *Salix* sp., on a lime-ash bank, at about 1230 ft.

OLEACEAE.

472/1. LIGUSTRUM VULGARE L. Well established on limestone rocks in the neighbourhood.

Ashwood Dale, Topley Pike, Monk's Dale, Chee Dale, Cressbrook Dale, Ravensdale, Deep Dale near Ashford.

APOCYNACEAE.

473/2. VINCA MINOR L. Cowdale Wood. An extensive patch on bankside.

GENTIANACEAE.

481/1. MENYANTHES TRIFOLIATA L. Jewitt's record, "Pool near the New Church, Buxton," is now obsolete, the pool having been filled in. Not known for limestone. One would expect to meet with it much more frequently on millstone grit than experience proves to be the case.

Moss Carr, Hollinsclough; and near the farm at head of Moss Carr (v.-c. 39).

POLEMONIACEAE.

486/1. POLEMONIUM COERULEUM L. Within recent years *Polemonium* seems to have extended its range in this part of Derbyshire. It is of strictly local occurrence, but when found is usually abundant. A few of the older records for Buxton are probably unreliable now.

Nuns Brook, Fairfield (Yoredale), about half-dozen clumps. An extensive area, coming close to the highway, on National Trust property, Taddington Wood, and not very far from the Café. By River Wye, near Ashford fishponds. Plentiful on bank overlooking river at Alport. Ricklow Dale, abundant on bankside not far from cave.

The rich colour of the flowers of *Polemonium*, in the wild state, is very marked.

BORAGINACEAE.

†497/4. SYMPHYTUM PEREGRINUM Ledeb. "By River Bradford, Youlgrave"; Purchas (*Fl. D.*). Still there.

SOLANACEAE.

524/1. HYOSCYAMUS NIGER L. Has appeared in several places during recent years as a casual.

SCROPHULARIACEAE.

527/3. VERBASCUM THAPSUS L. Ashwood Dale—bank overlooking sewage works. Plentiful in disused limestone quarry, near railway station, Miller's Dale. Tideswell Dale. Lathkill Dale.

527/8. V. NIGRUM L. Plentiful at Alport, near Youlgrave; in several places. (Recorded by Painter, 1889.)

532/7. LINARIA MINOR (L.) Desf. Great Rocks Dale. Abundant on High Peak Railway track near Friden.

532/26. L. CYMBALARIA (L.) Mill. Cowdale and Tideswell Dale.

LENTIBULARIACEAE.

553/2. PINGUICULA VULGARIS L. Grin Plantation, Buxton; on grass-covered banks of lime-ash. Ashwood Dale (Topley Pike end), abundant on embankment below railway, and in meadow immediately above. (Miss Hawkins—*vide* Robertson's Buxton Guide—has a record for *Pinguicula* at this point made prior to 1854.) Monk's Dale with *Parnassia* and the moss *Climacium dendroides* W. & M.

LABIATAE.

562/8. CALAMINTHA ACINOS (L.) Clairv. Tideswell Dale. Dovedale—Painter's record 1889 confirmed.

POLYGONACEAE.

615/3. POLYGONUM BISTORTA L. Temple fields, Buxton, an extensive patch. "Meadow near Grammar School, Buxton" (Baker, *Journ. Bot.*, 1884). This is now Buxton College playing field; Bistort is still abundant. North-west side St James' Church, Buxton.

†618/5. RUMEX ALPINUS L. Kirkham's farm, Brandside. Flash, near Buxton; by roadside in several places (v.-c. 39).

URTICACEAE.

634/1. HUMULUS LUPULUS L. Buxton College sports field, College Road. Old gritstone quarry, Nithen, Buxton.

641/1. [MYRICA GALE L. Not met with in the locality (probably not in v.-c. 57 at all), although soil conditions in many places would suggest its occurrence.]

SALICACEAE.

650/11. SALIX REPENS L. Grin Low, Buxton. Above Chee Tor.

ORCHIDACEAE.

662/1. NEOTTIA NIDUS-AVIS (L.) Rich. The record in *Flora of Derbyshire* for Lathkill is still authentic.

674/1. GYMNADENIA CONOPSEA (L.) R. Br. Frequent on grass-covered banks in Grin Plantation, Buxton, up to 1230 ft. Cunning Dale, a little. Topley Pike. An extensive patch on limestone grassland above Chee Dale, on south side. Ravensdale. Frequent on shaly bank near Packhorse Bridge, Washgate.

674/4. COELOGLOSSUM VIRIDE (L.) Hartm. Several places in Grin Plantation, Buxton. By roadside, on grass verge near Brierlow Bar.

With *Listera ovata*, *Parnassia palustris*, *Scabiosa Columbaria*, on bankside lower end of Ashwood Dale, near Topley Pike.

674/6. PLATANTHERA CHLORANTHA (Cust.) Rchb. Casual, Kingsterndale.

LILIACEAE.

694/1. CONVALLARIA MAJALIS L. Abundant above Chee Tor, also Cressbrook Dale, and Monsal Dale. Taddington Wood (National Trust Property). Dovedale, being a confirmation of Purchas' record (*Fl. D.*).

702/4. ALLIUM VINEALE L. var. BULBIFERUM Syme. On rock-shelf, by Raven's Tor, Miller's Dale, plentiful; also on bankside nearer Miller's Dale hamlet. Recorded in *Fl. D.* for Tideswell Dale; still there.

702/9. A. OLERACEUM L. Topley Pike—on narrow rock-shelf at base of escarpment.

716/1. PARIS QUADRIFOLIA L. Not seen up to present.

NAIADACEAE.

735/2. TRIGLOCHIN PALUSTRE L. Local and uncommon.

On marshy ground, Cavendish Golf Course, Buxton. Washgate Valley.

CYPERACEAE.

753/26. CAREX ORNITHOPODA Willd. Slopes of Highfield, Miller's Dale. (Burfoot is probably the more correct name).

This rare *Carex* is plentiful on the 750 ft. line, or thereabout. It was first recorded by C. C. Babington (*Journ. Bot.*, 1874) from specimens gathered by Mr J. Whitehead of Dunkinfield, in company with Messrs H. Newton and E. Hibbert. Subsequently F. A. Lees pointed out (*Bot. Loc. Rec. Club Report*, 1877) that a specimen of *C. ornithopoda* existed in Jonathan Salt's (Sheffield) herbarium "without date, locality, or collector's name." Linton, however, credits Salt with first finding the plant—May 7th, 1801—but labelled *C. digitata* L.

GRAMINEAE.

818/1. MELICA NUTANS L. Wooded area above railway, Ashwood Dale. Plentiful above Chee Tor. Monk's Dale; and Lathkill Dale in several places.

†829/4. LOLIUM MULTIFLORUM Lam. By roadside above Miller's Dale railway station.

CONIFERAE.

839/1. JUNIPERUS COMMUNIS L. Intensive search has been made for *J. communis* on the limestone cliffs of Ashwood Dale (the station recorded by Baker, *Journ. Bot.*, 1884), but without result.

840/1. TAXUS BACCATA L. Ashwood Dale and Deep Dale, near Buxton. Plentiful in Chee Dale, where it is frequently seen growing out of fissures in the rock face.

FILICES.

851/3. ASPLENIUM VIRIDE Huds. Abundant under rocks on south bank of Back Dale, where it is more frequent than *A. Trichomanes*, which is only occasional. Diamond Hill, frequent.

856/11. DRYOPTERIS ROBERTIANA (Hoffm.) C. Chr. Ashwood Dale—on embankment not far from Topley Pike quarry. By roadside ascending Topley Pike; more plentiful among rocks towards apex of hill. Monk's Dale; Ravensdale; Priestcliffe Lees; above Chee Tor, a little; and slopes of Burfoot, Miller's Dale, at 750-800 ft.

857/4. CYSTOPTERIS FRAGILIS (L.) Bernh. Frequent on limestone in damp shady spots.

Ashwood Dale and Cunning Dale, a little. Thirkelow Rocks; Monk's Dale; Chee Dale; Bradford Dale.

859/1. CETERACH OFFICINARUM DC. Extinct now, we fear.

865/1. **Botrychium Lunaria** (L.) Sw. Not common.
Reaches 1200 ft. on lime-ash banks, Grin Low, Buxton. A form with divided fertile frond is frequent here.

LYCOPODIACEAE.

870/. **Lycopodium** L. The *Flora of Derbyshire* has records for *L. Selago* and *L. clavatum*. Up to the present no station for any *Lycopodium* is known to us.

AN UNWORTHY TANGLE: PHUOPSIS STYLOSA BENTH. ET HOOK. FIL. (CRUCIANELLA STYLOSA TRIN.)—NOT " ASPERULA CILIATA ROCHEL "—IN BRITAIN.

Nicholas Polunin, M.S. Yale; M.A., D.Phil., D.Sc., Oxon.

In *Mém. Acad. Pétersb.*, VI (1818), Trinius described and figured as *Crucianella stylosa* a small but unmistakable Rubiaceous plant from south-western Asia which has since come to be grown in rock gardens in many parts of the world. In Britain and the United States it has become an established favourite, in spite of " its disagreeable odour, in consequence of which it is sometimes jocularly called *P. Foxii* " (according to Sir F. Crisp, *Abridged . . . Guide . . . to Friar Park*, p. 177, 1914). Thus H. Correvon (*Rock Garden and Alpine Plants*, p. 231, 1930) calls it " one of the treasures of the rock garden," and it is so easy to propagate vegetatively or from seeds, whence it spreads rapidly to form dense carpets, that there need be small wonder if *under various names* it has been reported as adventive in several parts of the British Isles. Although the chief morphological interest of this plant probably lies in the explosive mechanism of its closely aggregated flowers with their ultimately long-exserted styles (cf. A. Kerner v. Marilaun and F. W. Oliver, *The Natural History of Plants*, vol. II, pp. 265 et seq., 1895), it is with these various (often irreconcilable) names that the present note is primarily concerned.

In *Pl. Banat. rar.* (1828), *Asperula ciliata* Rochel was described and figured from the Banat region which during the latest peace was mostly included in western Rumania. Taxonomically this plant has nothing to do either with the earlier *Crucianella ciliata* Lam. or with the wholly distinct *C. stylosa* Trin., but unfortunately in 1830 (*Prod.*, IV, p. 582) A. P. De Candolle described an *Asperula ciliaris* which most subsequent authors have considered to be synonymous with Trinius's species. Although De Candolle's reference to Gmelin is indeed suggestive, it seems necessary to re-examine the type material (De Candolle said " v.s. in h. Mus. reg. Par.") before it can be finally decided whether this view is correct; but in any case this question does not affect the present issue as Trinius's specific name was validly published and would clearly take priority. Meanwhile it may be noted that five pages later in the same work De Candolle includes *Crucianella stylosa* Trin., complete with citation and unmistakable "stylo clavato longissimè exserto apice brevissimè bifido," though his reference to Peru should of course be changed to Persia (Prov. G[h]ilan); on the other hand De Candolle's *Asperula ciliaris* was merely " stylo exserto."

There seems to be very little doubt that *Asperula ciliata* Rochel, of which good specimens are to be seen in almost any herbarium, and which, according to H. G. Reichenbach (*Ic. Fl. Germ. et Helv.*, XVII, p. 103 and cf. pl. MCLXXX, 1855) " recedit ab. Asperula tinctoria L. praecedenti foliis junioribus bracteolisque ciliatis, fructu punctulato," is indeed a species wholly distinct not only from *Crucianella stylosa* but also from any other *Asperula*—see also Regel (*Ind. Sem. Hort. Petrop.*, Suppl., p. 21, 1864). Unfortunately, however, the Rochel name is invalidated by the earlier *Asperula ciliata* Moench (*Meth. Plant.*, p. 484, 1794), which is now usually " sunk " in (various) other species. Accordingly some new name is necessary for Rochel's plant, which is reputedly of restricted distribution and unlikely to be found in Britain. Such a new name may possibly be supplied by the recently substituted *Asperula hungarorum* Borbás ex Jávorka (*Magyar Fl.*, p. 1037, 1925), which although there a synonym and consequently useless may yet have been validly published elsewhere. This question we can leave for discussion with Central European botanists after the war.

To return to the highly characteristic plant described by Trinius: as Lindley quite understandably remarked (*Edwards's Bot. Register*, XXIV, p. 55, 1838), this " is certainly no Crucianella . . . and . . . requires to have some better place found for it." Such a need may even have been recognized at the time of its first collection, for Trinius (*l.c.*, p. 492) observes that " Hanc . . . plantam elegantissimam a Gmelino *Laxmannia fasciculata* dictam." This last generic name was not, however, validly published; moreover, it was antedated by no less than four different Laxmannias, one of which is conserved (*Kew Bulletin*, p. 93, 1940). Nor, apparently, can *Nemostylis* Chr. v. Steven (*Verz. taurischen Halbinsel wildwachs. Pfl.*, p. 187, 1857) help us, owing to the existence of an earlier *Nemastylis* Nutt. (1837) and its orthographic variant *Nemostylis* (1840). Nor do Boissier's combination *Asperula stylosa* and his statement (*Diagn. Pl. Or.*, I, 3, p. 31, 1843) that it " *Asperulis* nec *Crucianellis* evidenter adnumeranda est " seem tenable, when one considers the pertinent characters in the light of generic descriptions. On the other hand, A. Grisebach (*Spic. Fl. rumel. et bith.*, II, p. 167, 1844) remarks that " Sectionem propriam Phuopsiden . . . format *Crucianella stylosa*," and this is cited (wrong page) by G. Bentham and J. D. Hooker (*Gen. Plant.*, II, 1, p. 151, 1873) in founding the new genus *Phuopsis* (a name already published for a section by Walpers, *Repert.*, VI, p. 25, 1846) to receive Trinius's plant. *Phuopsis stylosa* (Trin.) " Benth. et Hook. fil." ex Jackson in *Index Kewensis*, II, p. 505, 1895, would accordingly seem to be the best name for what is still the only known member of this genus—cf. also Jackson, *l.c.* and p. 1278 (though the combination was not actually made, even if it was meant, in the place cited by Jackson); Engler and Prantl, *Die nat. Pflanzenfam.*, IV, 4, p. 148, 1897; Hegi, *Illust. Fl. Mittel-Eur.*, VI, 1, p. 196, 1918 (in the last two and many other works the combination is attributed to Grisebach, but I have not been able to find where, if ever, he published it); Willis, *Dict. Fl. Pl. Ferns*, ed. 5, p. 506, 1925; etc. Mr N. Y. Sandwith assures me that it is permissible to cite Bentham and Hooker (ex Jackson) as the authors of the combination *Phuopsis stylosa*, and that this combination is legally made in *Index Kewensis*, although Mr A. J. Wilmott considers (*in lit.*) that it is there

" nomen nudum because the reference given doesn't exist!" The whole unfortunate subject is indeed a succession of lamentable errors and unscholarly omissions of the worst order.

Now as to the British reports of *Phuopsis stylosa*; these have indeed occasionally in the past been under the possibly legitimate but certainly less desirable name *Crucianella stylosa* (e.g., in S. T. Dunn, *Alien Flora of Britain*, p. 94, 1905, though he has both the author and the " habitat " wrong), but usually as " *Asperula ciliata* Rochel "! As outstanding examples we may refer to *B.E.C. 1911 Rep.*, p. 54 (1912), *1921 Rep.*, p. 383 (1922), *1922 Rep.*, p. 729 (1923), *1925 Rep.*, p. 877 (1926), *1926 Rep.*, p. 116 (1927), and *1927 Rep.*, p. 398 (1928). The specimens on which most of these reports were based lie before me in Herb. Druce, and clearly belong to *Phuopsis stylosa*; so do the reports of " *Asperula ciliata* Rochel " in Druce's *British Plant List*, in the second edition of which (p. 53, 1928) the distribution is unfortunately given as " W. Eur." Nor were my distinguished predecessor in the Fielding Curatorship and his British followers alone in the dark; the mistake has followed the plant to other lands. In spite of the warning by Boissier (*l.c.*) that " Nomen specificum Candolleanum [*ciliaris*] retinere non potui propter confusionem cum antiquiori *A. ciliatâ* Rochel," Steudel (*Nomenclator Botanicus*, I, p. 448, 1840) having made just such a confusion, it would appear that the frequency of the mistake is due chiefly to an error in the first volume of *Index Kewensis* (1895), though this was speedily rectified in the " Addenda et Emendanda " at the end of the second volume (p. 1278, 1895). Thus, whereas in vol. I we are given on p. 214 " Asperula . . . *ciliaris*, DC. *Prod.* iv 582 = stylosa " (which latter, of Boissier, is upheld as a valid species), and then ". . . ciliata, *Rochel*, *Banat.* t. ix f. 22 " (which is also upheld, and separate), on p. 658 we have " Crucianella . . . *stylosa*, Trin. . . . = Asperula ciliata " (instead of " stylosa," or *ciliaris* in deference to which Boissier's combination (*l.c.*) was made and which would have led to the same " stylosa "). In consequence Rochel's name was indicated and has been rather generally employed, though, as we have seen, his plant is far removed from *Phuopsis stylosa*; to this last certainly most and probably all British reports of *Asperula ciliata* should be transferred. Thus, it is hoped, may be resolved, at least as far as British botany is concerned, what has long remained a most unworthy tangle.

Herbarium, Department of Botany,
Oxford University.

SCHKUHRIA IN THE BRITISH PLANT LIST.

N. Y. Sandwith, M.A., F.L.S.

†360. Schkuhria Roth (1797) *nomen conservandum*, non *Sckuhria* Moench (1794). *Tetracarpum* Moench, *Meth. Suppl.*, 240 (1802).

British alien material of this American genus of Compositae has to be revised, and Druce's List emended, in accordance with the researches of Dr Angel L. Cabrera in *Anales de la Sociedad Científica Argentina*, cxiv, 8-14 (1932). That some revision was needed was indicated several years ago in *The Adventive Flora of the Port of Bristol* (*B.E.C. 1932 Rep.*, p. 339). The five names appearing in Druce's List (1928), viz., *S. pinnata* O. K. (*abrotanoides* Roth), *S. isopappa* Bth., *S. advena* Thell. and *S. bonariensis* Hook. et Arn., are reshuffled nomenclaturally and taxonomically by Cabrera in such a way as to fall into the synonymy of two varieties of a single South American species, *S. pinnata* (Lam.) "Kze." Study of an abundance of Argentine material has convinced Dr Cabrera that *S. pinnata* is a species varying considerably in the shape and size of the paleae of the pappus, characters on which distinct species have been based. The eight paleae may all be awnless, blunt and short, or all long-awned; and between these extremes there is a large series of intermediate forms. He distinguishes, however, three predominating types as varieties, with the following key:—

Paleae all aristate, uniformly attennate towards the apex and overtopping the corolla (rarely one of the paleae is muticous or submuticous) .... var. *octoaristata* (DC.) Cabrera.
Paleae partly or wholly muticous, generally brusquely attenuate at the apex and shorter than or equalling the corolla:
    Paleae all muticous, more or less obtuse (sometimes one or two paleae aristate) .... var. *typica* Cabrera (*S. isopappa* Bth. and *S. advena* Thell.).
    Paleae generally 4 muticous and 4 aristate .... var. *abrotanoides* (Roth) Cabrera (*S. abrotanoides* Roth and *S. bonariensis* Hook. et Arn.).

British material of *Schkuhria*, so far as has been seen, is referable to two of these varieties, as follows:

S. pinnata (Lam.) Thell. var. *typica* Cabrera. 34, W. Gloucester: Wee Lane, Bristol, 1917, *Sandwith* (Herb. Sandwith, Druce; det. as *S. advena* by Thellung); Baptist Mills, Bristol, 1926, *Sandwith* (Herb. Kew., Sandwith). 64 (*sic* Cryer in sched.), Mid-west Yorks.: waste ground, Bradford, 1919, *Cryer*, "No. 5" (Herb. Kew.). 79, Selkirk: Tweedside, Galashiels, Oct. 1918, *Miss I. M. Hayward* (Herb. Druce; identified as *S. bonariensis* by W. B. Turrill). In all these specimens the paleae are short, obtuse, awnless and subequal.

S. pinnata (Lam.) Thell. var. *abrotanoides* (Roth) Cabrera. 34, W. Gloucester: St Philip's Marsh, Bristol, 1900, *Bucknall* (Herb. White in Herb. Univ. Bristol); Avonmouth Docks, 1932, *Evans* (Herb. Sandwith). 64, Mid-west Yorks: waste ground, Bradford, 1919, *Cryer* (Herb. White in Herb. Univ. Bristol); this specimen was gathered three days before var. *typica*, and was un-numbered. In all these specimens 4 short, rounded-obtuse, awnless paleae alternate with 4 which are much longer and conspicuously aristate.

Three comments may be made on Cabrera's account of *Schkuhria*:—

(1) The name *Schkuhria* Roth is a later homonym of the differently spelled *Sckuhria* Moench, both genera having been named in honour of the same botanist, Christian Schkuhr of Wittenberg. Moench himself deliberately re-named Roth's *Schkuhria*, giving it the name *Tetracarpum*. But *Schkuhria* Roth has been recommended and accepted for the list of *nomina conservanda*, for the obvious reason that it has been retained by the great majority of authors, while *Sckuhria* Moench, which was based on *Siegesbeckia flosculosa* L'Hérit., has been almost universally regarded as a synonym of *Siegesbeckia*.

(2) Cabrera and others have attributed the combination *Schkuhria pinnata*, based on *Pectis pinnata* Lam., to Kuntze, *Rev. Gen.*, iii, 2, 170 (1898) " como sinónimo de *Rothia pinnata*." In fact, Kuntze wrote " *R. pinnata* OK. (*Pectis pinnata* Lam. 1792 = *Schkuhria pinnata* OK. olim = *Schkuhria abrotanoides* Roth 1797)." No previous citation of the binomial *Schkuhria pinnata* by Kuntze has been traced, and its publication by him as a rejected synonym does not, according to the International Rules, validate the attribution of this combination to him. The combination *Schkuhria pinnata* (Lam.) should apparently date from its adoption, and therefore valid publication, by Thellung in Fedde, *Rep. Sp. Nov.*, xi, 308 (1912).

(3) Cabrera has perhaps not read Roth's own description of *S. abrotanoides* and is basing his conception of it upon the emended description given by de Candolle in *Prodr.*, v, 654 (1836). Roth himself, in *Cat. Bot.*, i, 116 (1797), described the pappus-scales as 5, rarely 6 or 7, obovat, obtuse, beautifully incised-ciliate at the apex. Now this description might well be taken to apply better to Cabrera's var. *typica*, in which the obtuse exaristate scales are neatly scalloped near the apex, than to his var. *abrotanoides*, and was responsible for some remarks to this effect in *The Adventive Flora of Bristol*, *l.c.* However, the eponymous botanist Schkuhr himself both described and figured *S. abrotanoides* Roth in his *Bot. Handb.*, iii, 126, and t. CCL, b (? 1803), references cited by de Candolle and evidently responsible, at least in part, for his emended description. The flowers and fruits are carefully figured, and the " incised-ciliate " pappus-scales, four of which are longer than the others, attenuate and aristate, leave no doubt as to the identity of the plant with Cabrera's var. *abrotanoides*. Moreover, in his description, Schkuhr writes of the fruit as " mit 8 Spreublättchen gekront, wovon 4 wechselsweise kleiner sind." It is most unlikely that the plants described by Roth and Schkuhr within a few years and in each instance from living cultivated material could have represented different varieties of *S. pinnata*, and it is reasonable to conclude that Cabrera's interpretation of *S. abrotanoides* Roth may stand.

SOME REMARKS ON BRITISH RHINANTHUS.

A. J. Wilmott.

[This paper was written early in 1940, the Latin descriptions of the new forms being sent to the *Journal of Botany* (lxxviii, 201-213) with the necessary explanations: the delay in the publication of the B.E.C. Reports prevented the contemporary appearance of this, which was the original, paper.]

The genus *Rhinanthus* has received comparatively little study by British botanists. In 1900 or early in 1901 G. C. Druce sent his collection of this genus to Sterneck, who had published several papers dealing with its European forms, and who in 1901 published a monograph ("Monographie der Gattung *Alectorolophus*;" in *Abhandl. der K.K.Z.-b.G. in Wien*, i, part 2, pp. 1-150, tt. i-iv). Druce published the results of Sterneck's examination in the *Annals of Scottish Natural History* (1901: pp. 177-178), adding *A. stenophyllus* (Schur) Sterneck, *A. borealis* (Sterneck) Sterneck—with calyx surface puberulous, and *A. monticola* ("Lamotte") Sterneck, to the British list. In his monograph, Sterneck distinguished a second British species with the calyx surface puberulous, *A. Drummond-Hayi* ("White") Sterneck, but since he made no attempt to see the original specimens of Buchanan White's *Rhinanthus Crista-galli* var. *Drummond-Hayi*, he remained unaware that the types of that plant (from Ben Lawers) were what he was calling *A. borealis*, and the name *A. Drummond-Hayi* was therefore illegitimate.

Druce, in his article, gave no differentiating characters for the species he recorded, but E. S. Marshall, after sending his own herbarium material to Sterneck for revision (in 1902), published in 1903 a paper "On the British forms of *Rhinanthus*" (*Journ. Bot.*, xli, 291-300), reproducing the descriptions from Sterneck's monograph. The retention of the name *Rhinanthus* in preference to that of *Alectorolophus* has since been shown to be correct by Pennell (1931: *Proc. Acad. Sci. Philadelphia*, lxxxii, 16) who demonstrates that Linnaeus described *Rhinanthus* from material of *Rhinanthus Crista-galli* L. In that article, Marshall added *A. rusticulus* (Chabert) Sterneck to our list, from Orkney. In 1907, Beeby (in *Ann. Scott. Nat. Hist.*, p. 234) added *R. groenlandicus* Chabert (from Shetland) on the strength of Ostenfeld's determination of his Shetland material. In 1922, I summarised (in Babington, *Manual*, ed. x, Appendix II, pp. 584-586) from Sterneck's Monograph the characters of these plants, placing *R. groenlandicus* in the position (? wrongly) assigned to it by Ostenfeld. In 1929 Soó (in Fedde. *Repert.*, xxvi, 179-219) published an account of the middle- and south-east-European species and forms of the genus. Whilst working in London he had examined the material in the herbarium of C. E. Salmon, and as a result he mentions in his paper (p. 182) a "ssp. *Salmonii* Soó aus dem Formenkreise von *Rh. Drummond-Hayi* (Withe) [sic !] Druce emend. Soó: Schottland,'' following a remark that some species with hairy calyx have also glabrescent forms.

Soó's determinations in Herb. Salmon appear to have been made at two different periods. One series, dated 1928, are in lead pencil, and use names as published in his paper; the other, in red pencil, use names referred to synonymy in the paper, and are presumably earlier. Soó separates from *R. Crista-galli* L. " 1. typus,'' " 2. ssp. *elatior* (Schur) Soó (=*A. minor* f. *ramosus* Poverlein 1905: in *Ber. Bayer. Bot. Ges.*, x, p. 10) with a f. *genevensis* [of Poverlein, *l.c.*, wrongly attributed by Soó to Chabert, who described it without a name] and a " 2b. var. *longiramosus* (Schur) Soó (=*A. minor* f. *longiramosus* Poverlein, *l.c.*). Soó reduces the description of f. *genevensis* to (translated) " leaves coarsely serrate-dentate. (The type also has similar forms),'' and, presumably in accordance with the last remark, he identifies (in Herb. Salmon) both " var. *ramosus* Poverl., resp. f. *genevensis* Chab." and " var. *ramosissimus* [presumably an error for " *ramosus* "] Poverl., resp. f. *genevensis* Chab.'' He also identifies, in Herb. Salmon, plants of various subspecies of *R. major*. Since 1929 the British forms of the genus do not appear to have received much attention.

For more than twenty years I have collected *Rhinanthus* in many parts of the British Isles, and I have recently incorporated in the British Herbarium of the British Museum most of the specimens there accumulated. As a result of a preliminary examination of this material, I find that existing accounts are quite inadequate to deal with the variation of the British forms of *R. Crista-galli* L. emend., i.e. *R. minor* Ehrh., sensu lato (whichever name may prove to be valid by International Rules of Nomenclature). The variation to be found in each locality needs much further study in the field, for the dried specimens are often, perhaps usually, insufficient to show whether one variable plant, or two or more distinct forms, really occurred. It is in the hope that British botanists, for the time being unable to travel far afield, may, as opportunity should occur, be interested to examine these plants in their own localities, and collect for me series adequate to show (with field notes) the range of variation in each locality, that I write these remarks on my preliminary investigation of the dried specimens.

It is well known that specimens of *Rhinanthus* generally blacken in drying. This blackening can only be prevented by quick drying in which the specimens are continuously in contact with dry warm drying paper, as when they are dried in a wire press, with plenty of airing boards, standing over a warm surface (e.g. in contact with a hot water tank) so that the warm dry air is continuously rising through the press. Specimens so dried (they become brittle but lose most of this brittleness after a time) keep much of their colour, but even then the chrome-yellow corollas tend to become a browner yellow almost or quite indistinguishable from the brown-yellow of some living corollas, so that field notes of the colour of the corolla (when opening, when older, and when withering) and of the corolla tooth, should be made and added on the labels. The bracts of *R. major* are generally yellowish green, and many, especially upland, forms of *R. minor* tend to be suffused with purple-violet on the bracts, calyces, and even stems. The stems may be quite green, or black-striolate, or suffused with some form of (reddish to violet and blackish) anthocyanin. As all these colourations have been used in descriptions, the variation in the field should be noted, and specimens of each variant collected in case these colourations should prove to be associated with morphological differences. As regards the colour of the corolla tooth of *R. minor*, my own impression is that in the British Isles it is generally blue or bluish, but on the continent the blue-toothed plant—var. *vittulatus* (Gremli: 1881, *Exkurs. Fl. Schweiz*, ed. iv, 380, as *Alectorolophus minor* var.)—is said to be less common, and some continental authors do not allow that *R. minor* ever has the tooth blue or the stem black-striolate, which is certainly incorrect as regards British plants. Typical small *R. minor* on chalk downs can have the stem striolate, and in several localities where I have made notes on the living plants I have found, among plants apparently otherwise indistinguishable, stems sometimes striolate and sometimes not. The colour of the corolla needs study from week to week to see if it changes; and if the same plant and corolla can be observed it would be useful to have field observations of any changes resulting from age. Typical chalk down *R. minor* has a (? broader) chrome-yellow corolla, but according to my field notes I have seen in Scotland yellow and brownish-yellow corollas on plants growing together, the narrow leaves with spreading teeth indicating that they were " *R. stenophyllus* " (with and without striolated stem) but the absence of intercalary leaves being contrary to such a determination.

The variation as regards " intercalary leaves " also requires field study. " Intercalary leaves " [a bad term] are those pairs of leaves which sometimes occur between the topmost branch of the stem and the lowest bract. They are said, by Sterneck and others who accept the theory of seasonal dimorphism, to characterise " autumnal " forms as opposed to " aestival " (summer) forms, but in one meadow by the Wye near Boughrood I have collected plants with one or two pairs of intercalary leaves growing with others without them in precisely the same stage of flowering and showing no obvious distinction other than the absence of intercalary leaves. Gatherings of dried specimens which I have seen indicate that in Britain such a state of affairs is not infrequent. According to the theory, the " aestival " and " autumnal " species—not very good terms, as Sterneck says, since the respective flowering times are given as " May-July " and " August-September "—should show the following differences:—

Aestival.	Autumnal.
lateral branches (few) directed narrowly upwards, never reaching the height of the main stem;	lateral branches (many) leaving the main stem at a right angle and then curving upwards, often "considerably" exceeding the main stem;

stem elongated, the stem leaves shorter than their internodes;	internodes usually shorter than the leaves, wherefore the plant gets a compressed bushy appearance;
leaves broader, more obtuse, directed obliquely upwards, and with amplexicaul base;	leaves narrower, often linear, more elongated, spreading horizontally or even recurved, the lowest shortly petiolate;
intercalary leaves none or one pair (although Sterneck says " none " for *R. minor*), exceptionally (according to Chabert) two pairs;	intercalary leaves three or more pairs;
	bracts with longer teeth;
	beginning to flower when the *aestivales* are dried up or at least in full fruit.

Commenting on this theory Chabert (1899: " Etude sur le Genre *Rhinanthus* L."; in *Bull. Herb. Boiss.*, vii, 447) says that his studies have convinced him that two parallel series or races—the one early flowering, the other late flowering—do exist in the genus, and that the plants of each series are for the most part recognisable by a combination of characters easy to verify, but that the characters are not as constant as one would wish and that the dimorphism shows numerous exceptions. He adds that if one explores an extensive district (two or more kilometres) where an early flowering species abounds over vast areas, one observes individuals having all the characters of autumnal plants, and one also finds, among late flowering *Rhinanthus*, specimens with simple stem, broader leaves, etc., wearing, so to speak, the livery of the early flowering ones. This agrees with my own observations, and C. E. Salmon commented (1928: *Wats. Bot. Exch. Club 1927/8 Rep.*, 440) on a gathering made by J. E. Lousley in 22, Berkshire (by the Kennet Canal, Burghfield, 5th June, 1927): " As this gathering shows, *R. minor* does *occasionally* have leaves on the stem above the uppermost pair of branches, in spite of Sterneck's statement to the contrary. One could not hesitate to place all this gathering under the same name," Lousley adding " I believe that these intercalary leaves occur chiefly when *R. minor* is growing in exceptionally moist situations (e.g. also at Hedge Court Pond, Surrey)." Mr Lousley's suggestion needs further testing in the field.

While admitting that *R. stenophyllus*, *R. calcareus*, *R. spadiceus* (" *R. monticola* " auct.), and *R. lochabrensis* normally have intercalary leaves, and that typical *R. minor* and *R. borealis* normally lack them, I find it impossible to use this character to separate *R. minor* from *R. stenophyllus*, as there appear to be so many intergrades between these two last. In both one may find plants with and without intercalary leaves, plants with broader leaves and others with narrower, plants with elongated leaves and others with shorter ones, leaf-teeth spreading or not, flowers yellow or brown-yellow, corolla tooth blue and corolla tooth white, stem black-striolate or not. As regards the breadth of leaf, I find that both *R. minor* and *R. borealis*—both normally with broad leaves—

are in some places associated with plants with much narrower leaves but otherwise apparently indistinguishable, which suggests that in *Rhinanthus*, as in some other genera (e.g. *Salix*, *Orobus*) each (or most) species may have a broad- and a narrow-leaved form, sometimes the one commoner sometimes the other, presumably due to a single gene difference. Moreover, since unbranched specimens can so often be found, which appear to be otherwise the same as the branched individuals, one needs characters other than that of the presence or absence of intercalary leaves for the identification of these simple-stemmed plants.

The failure of the simple theory of seasonal dimorphism—in this genus at least—has led to a more expanded form of the theory. Soó (1929: 180-181) classifies these " pseudoseasonal-polymorphic races " thus:—

1-4. " Campicole " forms (valley races), tall growing forms.
  1. " Vernal " races, with simple or scarcely branched stems, side branches mostly sterile, short and few; internodes long; intercalary leaves none; fl. May-June.
  2. " Aestival " races, with branched stems, with 2-4 mostly flowering pairs of branches; internodes shorter; intercalary leaves 0-1 pair; fl. June-July; commonly mixed with the preceding.
  3. " Autumnal " races, with richly branched stem, with many pairs of long flowering branches; internodes short; intercalary leaves 2-many pairs; fl. August-September.
  4. " Subautumnal " races—better differentiated only in *R. major*—as the preceding but with 0-1 pair of intercalary leaves (but transition forms " 2-3 " [? with 2-3 pairs] occur mostly mixed with the autumnal races).

5-7. " Monticole " forms (Mountain races including Alpine races). small forms.
  5. " Vernal-monticole: alpine " races: as the aestival races, but dwarf; internodes numerous, short; intercalary leaves 0-1 pair; fl. June-July. Alpine races.
  6. " Monticole " (previously most called monomorphic) races: as the aestival races, but dwarf; lower internodes short; intercalary leaves 0-2 pairs: fl. June-July. Montane races.
  7. " Autumnal-monticole: alpine " races: as the autumnal races, but dwarf; fl. August-September. Alpine races.

Soó adds: " In addition, transition forms occur between the various monticole, and between the campicole and monticole races, which are, however, generally rare. For many monticole groups, moreover, the dark-violet suffused calyx is characteristic."

Whether, with such complications—and transitions—, the seasonal polymorphism theory (even if " pseudo-") can usefully be applied to the

British forms of *Rhinanthus*, should be tested in their own areas by British botanists. Soó places all the forms with which he deals in a table (pp. 214-215), which, so far as British plants are concerned, runs thus:—

Species.	Vernal.	Aestival.	Autumnal.	Subautumnal	
Crista-galli	typus	elatior	stenophyllus	v. ramosissimus	campicole
—	rusticulus	—	monticola	—	monticole
Drummond-Hayi	borealis	—	—	—	campicole
—	Drummond-Hayi	—	—	—	—
major	typus	aestivalis	serotinus	—	campicole
—	—	—	polycladus	—	monticole
apterus	—	apterus	—	—	—
Borbasii	Borbasii	—	—	—	campicole

For the purposes of this article, i.e. to assist those who may be interested in helping to disentangle the confusion by collecting and sending me series of specimens with field observations, the following notes on the characters of forms of *R. minor* and its near allies may be useful.

R. minor Ehrh. Typically (apparently) the small almost simple-stemmed plant (though often with very short (? not developing) branches), of chalk and limestone short grassland, with broad obtuse leaves having more or less appressed teeth, (usually) no intercalary leaves, and broad chrome-yellow corollas; mostly S.W. to N.E. England and E. Scotland.

R. stenophyllus (Schur) Druce. Taller, branched, with longer narrow and acute tapering leaves, teeth in this country usually spreading, intercalary leaves usually two pairs, corolla perhaps narrower, usually brownish-yellow. Common in Scotland, also in western England; a similar form in East Anglian Fens is specially required for study.

Between these two, however, I find intermediates of all sorts. The common plant of alluvial valley meadows in southern England is larger, but still with (generally !) broad obtuse leaves, and may have one (or two) pairs of intercalary leaves. Plants are sometimes found with narrower but parallel-sided leaves which do not taper. Plants two feet high with very broad leaves also occur in some places [var. *robustus* Druce (1922: in *B.E.C. 1921 Rep.*, 300); lectotype (now chosen by me) in Herb. Druce from 9, Wareham, June 1916].

The forms of " *R. Crista-galli* " are described by Soó (1929: 185-) thus:—

1. *typus.* Stem 10-50 cm. high, simple or with 1 (-) pairs of short sterile branches; internodes few, elongate. Leaves 5-10 (-15) mm. broad, intercalary none. Inflorescence beginning at node 5-7. Flowers May-June.

f. *minimus* (Schur) = *A. minor* f. *gracilis* Poverlein. Stem to 15 cm. high, slender, few-flowered. With the type.

f. *vittulatus* (Gremli). Tooth of upper [corolla] lip larger, violet. With the type.

2. ssp. *elatior* (Schur) Soó = *A. minor* f. *ramosus* Poverlein. Stem to 50 cm. high, branched, with 1-3 (4) pairs of short suberect flowering branches; internodes several, elongate. Leaves 5-10 (-15) mm. broad, intercalary none (rarely one pair). Inflorescence beginning at node 6-9 (10). Flowers June (-July).

f. *generensis* Chabert. Leaves coarsely serrate-dentate. (The type has similar forms). [N.B.—Chabert's description of the form around Geneva was: Stem 20-30 cm. high, black-striolate, thick, quadrangular, branched, intercalary leaves none, branches spreading or obliquely ascending, leaves broad, oblong-lanceolate, with coarse teeth, those of the lower leaves porrect, those of the upper slightly spreading, bracts yellowish-green, style sometimes included [in the corolla] and recurved at the end of anthesis, sometimes projecting horizontally.]

2b. var. *ramosissimus* (Schur) Soó = *A. minor* f. *longiramosus* Poverlein. As the preceding, but stem with many pairs of erect-arcuate elongated branches (subequal to or longer than the main stem), intercalary leaves 0-1 [pair], stem leaves often narrow.

Once again, I must admit that I cannot fit the characters given by Soó to the British material I have seen: all sorts of intermediates seem to occur.

On the Downs of Southern England there occurs a very narrow-leaved tall slender plant, much branched in the lower half, the upper part of the stem with greatly elongated internodes (averaging 5 cm. in length) and many pairs of shorter (but still narrowing from a broadened base) intercalary leaves. It is certainly distinct from the narrow-leaved plant commonly met with in Scotland which, for reasons given in my paper in the *Journal of Botany*, I have referred to as *R. stenophyllus* (Schur) Druce, and in that paper I have named it *R. calcareus*. It is certainly a late-flowering species. The leaves are only 2-3 mm. broad although over 2 cm. long, and they are wide-spreading or even recurved. The fruiting calyx is small, only about 12 × 9-11 mm. long and broad, and the capsule is nearly round, 8-9½ mm. long and 9-9½ mm. broad. I add the localities whence I have seen specimens, in case any member has the opportunity of visiting any of them and confirming those which are doubtful on account of the poorness of the available material.

Localities mentioned without details refer to the records already published in the *Journal of Botany*, 1940; the remainder are of additions since that date:—

7, N. Wilts. North Down, near Colne, 7.9.1941, E. C. Wallace (No. 4550).

8, S. Wilts. Ham Hill [the date of collection was erroneously printed as 1927 instead of 1937]; Littleton Down, Imber, 14.8.1938, J. D. Grose, who writes: "*R. calcareus* suffers terribly on the downs, presumably by the nibbling of rabbits. Extensive colonies may be found in which every plant has been mutilated in this way. The secondary growth is usually profuse, and it is just the central stem which has been bitten short before it became tough and wiry. I have had no doubt of the identity of these plants, but have not collected them. My distinct impression is that this species is the common form of our chalk downs." [The plant recorded by E. S. Marshall (No. 2715) as *R. stenophyllus* (*Journ. Bot.*, 1904, 171) from Arn Hill, Warminster, is not *R. calcareus*.]

9, Dorset. Melbury Hill (chalk); Bere Regis (chalk bank).

12, N. Hants. Hawkley, 31.8.1941, E. C. Wallace.

13, W. Sussex. Downs above (S. of) Sutton; Littleton Farm, near Duncton, by lane side towards Downs; Pangdean. In 1941 I collected it with E. C. Wallace on Barlavington Down, very near the type locality; the plant is very stiff and harsh to the touch; one specimen had 7 pairs of intercalary leaves.

14, E. Sussex. Lewes Downs ?

15, E. Kent. Dover ?

23, Oxon. Wytham ?

H.9, Clare. Ballyvaghan, 10.8.1939, W. A. Sledge. The larger specimens of this gathering had the main stems eaten off near the base.

H.15, S.E. Galway. Field and roadside near Kinvarra, 10.8.1935, N. D. Simpson, as *R. stenophyllus*—poor (starved?) specimens, but the intercalary leaves 6, 4, 3, and 1, together with the very narrow leaves, leave little doubt of the identification.

The plant which has been called *R. monticola* (Lamotte) Marshall is not the plant which Lamotte intended by *R. minor* var. *monticola*, as I pointed out in the *Journal of Botany* (1940: 203-), where I named the Scottish plant *R. spadiceus* because of its dark "treacle-brown" flowers. It is a small plant, usually 10-15 cm. high, typically considerably branched below with short mostly abortive branches and there with very greatly contracted internodes, so that the leaves and branches are crowded towards the base of the plant while the upper 3-4 internodes are much elongated. The intercalary leaves are 1-3 (4-5) pairs, and this makes the habit variable since the top branches (if intercalary leaves are few) may be in the part of the stem with elongated internodes instead of all branches being in the contracted portion. The upper branches may also be somewhat elongated and with a flower. Simple- or subsimple-stemmed plants are often found among typically branched ones. The inflorescence is lax and few-flowered, the usually small calyx being much suffused with blackish-violet (often other parts also). It has been collected in many parts of the Scottish Highlands, in grassy places in heather moor, and at lower elevations as one goes north. It has also been recorded for Yorkshire. Soó names some plants from the south of England as "*R. monticola*," but these are, I think, only contracted forms of other species, growing in dry situations and possibly collected in dry seasons. The variation in length of internode from the bottom to the top of the stem evidently needs intensive study, in relation not only to the occasional areas of contraction, but also to the effect of dampness and dryness of the habitat and of the season, and to the time of the year (in relation to the seasonal dimorphism theory). As I extracted from this paper into the *Journal of Botany*:—"I am not completely satisfied as to the status of this plant. In some localities it is found comparatively uniform and unmistakeable, and then it seems to deserve the rank of species which it has been given. But *R. stenophyllus* can be found with a certain aggregation of leaves and branches below the middle, due to contracted internodes; it can have dark flowers (among plants with yellow ones), and can be suffused about the calyx with deep violet; it might be suspected that if it grew in dryish upland peat instead of in lowland meadows it would sometimes take on a form very like that of *R. spadiceus*. Some intermediate taller plants have been identified by Soó as '*R. monticola*,' and among the mass of material in Herb. Mus. Brit. there are many plants which in various ways seem to be intermediate between the two species. It is possible that hybridity cannot be excluded, since hybrids between *R. major* and *R. minor* are recognised, but so far as I am aware these parasitic plants have not been cultivated, and data are completely lacking. The numerous forms now referred to either *R. minor* or to *R. stenophyllus* still remain to be disentangled, and until that has been done it is impossible to be more definite concerning the status of *R. spadiceus*. Further field observations are needed to clear up the relationships between the various forms of the series *Minores* which have the surface of the calyx glabrous."

Plants distributed from Orkney "Mainland" by H. H. Johnston (Numbers 1879 and 2714) differ in various respects from typical *R. spadiceus* and I have named them (1940: 207) ssp. *orcadensis*. The stem is more dwarf, 7-12 (14) cm. high, simple or (generally) branched, and lacks the elongated internodes although it may have 1-2 pairs of intercalary leaves. The plant therefore looks like a little bush, as its upper branches are frequently relatively elongated and may flower. The leaves are spreading and often recurved, and are usually broader, and the plant gets from these features of stem and leaf quite a distinct facies. The corolla also, in the dried plant, seems to be broader and the lower lip looks larger.

R. rusticulus (Chabert) Druce is a small unbranched plant originally recorded for Britain from Orkney (S. side of Loch Stenness, Mainland, E. S. Marshall (No. 2442) and W. A. Shoolbred, 13.7.1900): see *Journ. Bot.*, xli, 295 (1903). The specimens cited do not appear to be quite identical with simple-stemmed forms of *R. minor*, but since simple-stemmed forms of other species occur, I am not prepared to say whether they really represent a distinct species. Small unbranched plants like these need further field study in relation to larger plants occurring in the same district; for instance, whether some may not be small forms of *R. stenophyllus*, or even of *R. spadiceus*, needs examination.

R. Perrieri and *R. rusticulus* were originally described by Chabert (1899: 512) as a variety of *R. minor* which he found growing " gregariously on chalk marl from 1200-1300 metres in subalpine meadows on Mt. Nivolet in Savoy—stem 5-8 cm. high, simple or more rarely with two abortive branches, green, with 2-6 flowers; internodes sometimes longer sometimes shorter than the leaves; stem leaves oblong, obtuse, with obtuse spreading teeth." The word " gregariously " is to be understood from his remarks on p. 431:—" *R. minor* grows as solitary individuals, *R. minor rusticulus* forms extended colonies, *R. Perrieri* grows in tufts." Sterneck (1901: 108), followed by Soó (1929: 187) unites *R. Perrieri* with *R. minor* var. *rusticulus* (for which combination the names *A.* and *R. Perrieri* should by International Rules have been used). According to Chabert, *R. Perrieri* was specially distinguished by its accrescent corolla, the tube of which, when the flower opens, is included in the calyx, but is ultimately much longer than the calyx lobes. Except for the two characters already mentioned, there are only the following differences in Chabert's descriptions to distinguish *R. Perrieri* from *R. minor* and/or " *rusticulus* ":—small size and few flowers—which can be found in *R. minor* and are also characteristic of " *rusticulus*;" the stem is simple—but it can be so in *R. minor* and is usually so in " *rusticulus*;" the stem is black-striolate, not green as in " *rusticulus* " and perhaps usually in *R. minor*; the stem, bracts, and calyx are at first green but become rubescent and ultimately wine-red (" oenochroa "), whereas in *R. minor* they only become rubescent; the stem-leaves are shorter than the internodes, and whereas they may be so in " *rusticulus*," Chabert considers them to be longer than or subequalling the internodes in *R. minor*; the leaf teeth are spreading, as in " *rusticulus* " and are said to be not so in *R. minor*; the lowest teeth of the bracts are described as being " a little longer than the others, which decrease to the apex (acute, not aristate)," and in *R. minor* (not described in " *rusticulus* ") they are described as patulous, acute or acuminate, gradually shorter and porrect to the apex; the calyx is blackish-veined (p. 430), and is lanceolate (narrowly oblong, p. 436) when young, later broadening and swelling without elongating until it is ultimately rounded, but in *R. minor* (not described for " *rusticulus* ") it is always rounded; the corolla (14 mm. long) is yellow and fuscous spotted, but in *R. minor* (not described in " *rusticulus* ") it is unspotted; the corolla tooth is blue, whereas in *R. minor* (not described in " *rusticulus* ") Chabert describes it as flavid, pale, more rarely violet; and it is reduced to a little oval protuberance (p. 444), whereas in *R. minor* it is described as obliquely ovate with rounded apex, c. 1 mm. long and 1.2-1.8 mm. broad; the lower corolla lip is one-third shorter than the upper and in *R. minor* it varies from one-quarter to one-half shorter; its lobes are rounded but in *R. minor* they are rounded or oblong; it grew on schist (not on chalk like "*rusticulus*") at 2100 to 2300 metres on the south side of Mt. Longcôte in the Savoy.

Certainly, small simple-stemmed plants with dusky calyx occur in the Scottish Highlands, and sometimes they are associated with *R. spadiceus*. What, exactly, "tufted" and "gregarious" growth is meant to signify, I do not precisely understand: the original habitats in the Savoy need re-examination and these features more precise description, but any signs of such growth in Britain should be noted by collectors for the benefit of whom this analysis of the original descriptions of *R. Perrieri* and "*rusticulus*" is given. It is clear, however, that if there be a distinct species, its name must be *R. Perrieri* Chab., and not *R. rusticulus* (Chabert) Druce, unless the two forms are not conspecific, in which case *R. rusticulus* (Chabert) would require a new name, as the previous use of this name was illegitimate.

R. groenlandicus Chabert. This was originally described (from Greenland material only) as 20-35 cm. high, unbranched, with thick prominently quadrangular (sometimes winged) stem, glabrous except for sparse hairs on the sides of the internodes; leaves oblong-lanceolate 5-6 cm. long and 1.5 cm. broad, rather fleshy (unique in this respect in the genus), with remote acute strongly spreading and sometimes outwardly curved teeth . . . Calyx glabrous (except for the finely ciliate glandular margin) much accrescent in fruit, 2 cm. transverse diameter, corolla 15 mm. long. . . . None of the Shetland material which has been identified as *R. groenlandicus* agrees with such a description. That from Burga Water collected by G. C. Druce, July 1921 (see *B.E.C. 1921 Rep.*, (1922), p. 573) has very divergent leaf teeth, but those from Unst, Bunafrith Cliffs, collected by Beeby (No. 641, 28.7.1886), originally identified by Ostenfeld as "*R. groenlandicus* Chab., good," according to Beeby (1907: in *Ann. Scott. Nat. Hist.*, 234; also *B.E.C. 1907 Rep.* (1908), p. 258) are small plants without spreading teeth. Many specimens of *Rhinanthus* were collected in Southern Greenland by Dr N. Polunin in 1937, and although many have very peculiar spreading teeth, some have the teeth appressed; one is tall and simple-stemmed, but its stem is not particularly glabrous; all have the calyx glabrous. Ostenfeld (1901: *Bot. Faroes*, pp. 51-55), discussing "*A. groenlandicus* and its var. *Drummond-Hayi* (B. White) Ostenfeld" at some length, says that Chabert's description is based on "specimens which were very large and robust, which is often the case with those from Greenland": but that it "is otherwise fairly correct, though he goes to the other extreme from Sterneck in emphasising the glabrosity of the species." He adds: "Further investigations show that among a large number of Arctic specimens there are always some with a hairy calyx, but the greater part with glabrous, though the specimens do not otherwise differ from each other in any respect." He states definitely that "*A. groenlandicus*" may "have sometimes the hairy calyx, but . . . this is rarely the case with regard to the main species." The Buchanan White specimens which Ostenfeld saw were from " Ben Lowers [sic], alt. 3350 feet," i.e. were of the type gathering of *R. Crista-galli* var. *Drummond-Hayi*, i.e. were *R. borealis* (Sterneck) E. S. Marshall. [This must be remembered in dealing with Beeby's (1907, *l.c.*) record of *R. Drummond-Hayi* for Shetland, teste Ostenfeld.*] Ostenfeld's figure (p. 53) shows small plants, none like the large Greenland specimens, and until the British and Greenland *Rhinanthus* forms are better understood, I do not consider that *R. groenlandicus* can be accepted as being a British plant. One of Dr Polunin's Greenland gatherings was of normal *R. borealis*, and Ostenfeld's remarks about the hairy and glabrous calyces in Greenland may have been due to an insufficient acquaintance with *R. borealis*.

Of the series *Minores*, there remain to be considered the species which have the surface of the calyx hairy. Of this character, Soó (1929: 182, translated) says:—" The hairiness of the calyx is very important; one can distinguish four main types: (a) with quite downy ("zottigem"), (b) with glandular-hairy, (c) with quite short-hairy, and (d) with glabrous calyx; but some species with hairy calyx also have glabrescent forms (. . . ssp. *Salmonii* Soó of the group (" Formenkreise ") of *R. Drummond-Hayi* [Withe] Druce emend. Soó, Scotland)." Our British species belong under (c), with short hairs.

R. borealis (Sterneck) Marshall is usually a simple-stemmed plant with broad obtuse—usually appressed-toothed—leaves and broad chrome yellow flowers, i.e. in general appearance it is somewhat like the small chalk-down form of *R. minor*. Yet, in addition to its hairy calyx, it has a facies of its own easy to recognise once one knows it well. It grows high up on mountain rock ledges [i.e., it certainly is not " campicole " with us], generally as a small or smallish plant, but sometimes, when luxuriant (as collected by C. E. Salmon in Clova, Glen Fiagh, S. corrie, 18.7.1912), as much as 23 cm. high or even taller, with leaves then as large as 47 × 11 mm. As in *R. minor*, there appears to be a narrower- (but still oblong- and obtuse-) leaved form of it, which grows alongside the broader-leaved form. The capsule becomes large (to 11 or even 13 mm. transverse diameter). For comparison with *R. Lintoni* and *R. lochabrensis* I add an account of its other characters:—Stem usually subsimple, 10-15 cm. or more high, not particularly hairy; internodes comparatively few, usually long (equalling or longer than the leaves)—but sometimes the whole plant is dwarfed because all the internodes are shorter (and then shorter than the leaves). Leaves normally oblong (i.e. more or less parallel-sided, not tapering) obtuse, the lower ones finely pubescent, especially on veins beneath, the upper ones and bracts becoming less pubescent and the veins not markedly more so (bracts sometimes glabrescent), teeth generally prominent because their tips tend to diverge outwards, but their outer margin concave rather than

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*Beeby's specimens in his herbarium are, however, not *R. borealis*: they are poor and almost leafless, but look nearest to my E. Ross gathering of " *Drummond-Hayi*," mentioned later.

convex; intercalary leaves usually absent, sometimes one pair. Bracts generally, but not always, longer than the calyx, their lowest teeth rather triangular and occasionally aristate. Calyx at first considerably longer than broad (oval-elliptic) but ultimately only slightly so and somewhat ovate (i.e. convex-sided to the usually blunt convex-sided teeth), large (e.g. to 18 × 17 mm.), *with* short *appressed hairs all over the surface* in addition to strong marginal pubescence. Corolla teeth deep blue, rather prominent, often directed somewhat upwards, often rather sharply decurrent downwards.

Specimens of any aberrant forms will be welcomed.

The existence of plants with glabrescent calyx, belonging under species having the calyx puberulous—"*R. Drummond-Hayi*" ssp. *Salmonii* Soó—has already been mentioned. This name referred to a form collected by C. E. Salmon on rocks at the foot of Craig Maid, Clova, determined by Soó in Herb. C. E. Salmon as "*R. borealis* F. ad. *R. minor* typ. vergens, calyce non solum ad margines, sed etiam superficie puberulo: *R. Salmonii* Soó n. f." Salmon had noted on them: "I have never seen *minor* proper as high as 2000 ft. . . . Calyx ciliate, otherwise apparently glabrous." I cannot understand Soó's remarks, for there does not appear to be a single hair on the surface of any calyx of the specimens in Herb. Salmon! Nor does the plant look like *R. borealis*. Certainly *R. minor* at that elevation would be unusual, and the plant needs further investigation *in situ*.

On the other hand, plants which do appear to be *R. borealis* with fewer hairs or glabrous patches on the surface of the calyx, which even then tends to remain normally puberulous near the margin towards the base, were collected by H. J. Riddelsdell on "Ben Nevis. July 1903" (labelled "*R. minor*," with "I think so" added by E. S. Marshall). These I have named (1940: 209) *R. borealis* var. *calvescens*. Another rather similar series was collected by Symers Macvicar in Westerness (Argyll) on Sgurr B. . . . [illegible], Moidart, 950-1400 feet, 2.8.1894. The series contains some specimens with normally puberulous calyx and one with glabrous calyx (except, of course, on the ciliate margin), and various degrees of glabrescence between the two extremes are shown by the remaining specimens. The series is very like *R. borealis*, but shows some differences: it looks reasonably uniform, although it may be that hybridity must be considered. Better material with field notes is required for examination. Ostenfeld, as pointed out under *R. groenlandicus*, indicates that this type of glabrescence is frequent in the Arctic, but certainly it is, from my own experience, extremely rare in the British Isles.

I have mentioned that the plant described by Sterneck as *A. Drummond-Hayi* (=*R. Drummond-Hayi* E. S. Marshall), is not the plant which Buchanan White originally described (in *Scott. Nat.*, 1886, p. 324) as *R. Crista-galli* var. *Drummond-Hayi*. White says that he has only seen the plant in one spot, on Ben Lawers, alt. 3350 feet, and his specimens prove to be *R. borealis*. He described the plant as without branches, and said that in the dried specimens he "cannot find any constant character by which this can be distinguished from the ordinary form of *R. Crista-galli* except the pubescent calyx," which he would scarcely have said of *A. Drummond-Hayi* Sterneck, with its very narrow peculiarly-toothed leaves. Sterneck also (1901: 116) seems weak in his geography, for after quoting "Withe" [i.e. Buchanan White, similarly mis-cited by Soó!]—"first found on Ben Lawers"—he goes on in the next line to say that he has [translated] "seen specimens from the original locality, Clova." The material in Herb. Mus. Brit. which has been named "*Drummond-Hayi*"—in one or other of its nomenclatural combinations—is not uniform. Two considerable series, one from Clova and the other from Glen Nevis, apparently represent distinct species, and I therefore described them as new species in the *Journal of Botany.* The first was collected by the brothers Linton and was distributed through the Botanical Exchange Club (*1889 Rep.* (1890), p. 266). I therefore named it:

R. Lintoni Wilmott (1940: 209). Stem 10-20 (27) cm. high, slender, simple or with weak branches which only rarely flower; *lower internodes short* so that the leaves (and branches if any) are congested near the base of the stem, *upper* internodes *much elongated* and *longer than the leaves. Leaves ascending* generally suberect, *narrow*, *linear-lanceolate*, gradually tapering to a more or less acute apex, in mid-stem about 30 × 3 mm. long and broad, the lower rather broader (-4½ mm.) and oblong not tapering, and with rounded terminal lobe, *leaf base scarcely broadened and often slightly narrowed*, surface finely pubescent all over especially on midrib beneath, teeth with concave margin and spreading tip; *intercalary leaves none or one pair.* Inflorescence few-, (2)3-4(5)-, flowered, secund. Lowest *bracts* either like upper leaves (or with slightly broader base) or transitional to fully developed bracts, which are ovate below contracted above into a narrow leaf-like prolongation *exceeding the calyx*, finely pubescent especially on veins beneath, the lower teeth subtriangular 2-3 times as long as broad, the lowest occasionally aristate. Calyx at first definitely longer than broad, ultimately slightly so, *with* very short *appressed hairs all over the surface* in addition to marginal pubescence; the subtriangular acute teeth about as long as broad and with glands as well as pubescence. Corolla c. 13-14 mm. long, with narrow scarcely projecting (? violet) teeth. Capsule rather broader than long (c. 9 × 10½ mm.). Seeds with broad wing (c. 1¼ mm.). Fl. July.

E. F. Linton first gathered this on 13.7.1889 in Glen Fiagh, but the specimens distributed were collected two days later, both "Glen Doll" and "Glen Fiagh" [E. F. Linton writes "Fiadh"] being mentioned in Herb. E. F. Linton. Some of the earlier gathering mounted by E. F. Linton was *R. borealis*, but he subsequently differentiated the two.

Naturally, the descriptions of this and of *R. lochabrensis*, being drawn up from dried specimens, are based on limited material. The characters given need testing in the field, and notes on colouration would be welcome. What seem to be the same species has been collected in:

88, Mid-Perth. N. side of Creag Mhor, Lawers, 18.7.1913, C. E. Salmon.

99, Dumbarton. Ben Voirlich (E. side), 10.7.1914, E. S. Marshall, (No. 3938).

The second plant which I described was collected in Glen Nevis, near Meall Cumhaun (in Lochaber parish), by C. E. Salmon, 19.8.1902:

R. lochabrensis Wilmott (1940: 211). Stem 10-15 (25) cm. high, stouter than in *R. Lintoni*, simple or with one rarely two pairs of weak branches which are rarely slightly elongated with one or two flowers, with more and longer pubescence in the lower part but more glabrescent above; *internodes elongated* even below the topmost branches, longest between the middle intercalary leaves. *Leaves patent*, or *spreading horizontally* (" arrect ") *or recurved*, rather shorter than in *R. Lintoni*, the lowest 20 (25) × 4 (4½) mm. long and broad, those in mid-stem as long as the lower leaves but in their base transitional to the intercalary leaves; *intercalary leaves* (rarely *1, 2-*) *3* (*-4*) *pairs*, usually rather shorter than the internodes but sometimes all the internodes are shorter and then the intercalary leaves slightly exceed them, shorter and broader than the lower leaves, *all or the upper subbractiform* ovate with elongated spreading lower teeth, less pubescent than the lower leaves. *Bracts* (except sometimes the lowest pair) *shorter than the fruiting calyx*, ovate-triangular, apex (except sometimes in the lowest pair) scarcely at all produced; even less pubescent than the intercalary leaves, lowest teeth only very rarely narrow and subaristate. Calyx at first considerably longer than broad, and remaining so in ripe fruit (e.g. 13 × 11½, 17 × 13½, sometimes smaller), *with* very short *appressed hairs all over the surface* in addition to the rather weak marginal pubescence. Corolla " wholly yellow " (C. E. Salmon), teeth more projecting than in *R. Lintoni*. Capsule small (8 × 8½ mm.), shallowly emarginate. Seeds with wing about 1 mm. broad. Fl. end July-August.

Rather poorly developed specimens which I collected by the " road " up Ben Nevis (35704Aa) are apparently *R. lochabrensis*.

Many gatherings named " *Drummond-Hayi* " are merely *R. borealis*, but some of them—judging from inadequate material—are difficult to fit into either that, *R. Lintoni*, or *R. lochabrensis*. They require further collection and field study. I therefore give the localities of such material seen by me:

92, S. Aberdeen. " Craigindal " [presumably Craig na Dala Beag].

97, Westerness. (Inverness): Aonach Beag; " Roshven Range " [Rois Bheinn], Moidart; (Argyll): Coire a' Chearcaill, near Conaglen.

98, Argyll (main): Ben Chasteil; Meall nan Tigearn.

107, E. Sutherland. Near the west end of Loch Lannsaidh (near Dornoch).

I have not yet made any intensive study of the British forms of *R. major*, but as Soó has determined specimens in Herb. C. E. Salmon as "ssp. *aestivalis* (Zinger)," "> ssp. *polycladus* (Zinger)," "ssp. *montanus* (but not typical)," and "ssp. *Borbasii* Dörfler," in addition to confirming a determination as "*A. apterus*," I add an account of the characters given by him (1929: 199-203).

The characters by which *R. major* Ehrh. can be easily distinguished from *R. minor* Ehrh. are:—(1) the elongated conical outstanding (c. 2 mm. long) corolla teeth; (2) the more deeply cut (to half-way) lowest (1-3) teeth of the bracts; (3) the closed throat of the corolla; (4) the lower lip being erect and appressed to the upper; (5) the corolla tube not straight but somewhat curved upwards; (6) often yellowish bracts.

Soó (1929: 199-) distinguishes—I omit forms not yet connected with the British Isles:—

§ grex *eumajor* Soó.

1. *typus*. *R. major* ssp. *eumajor* Sterneck (1901: 72) sensu stricto. Stem—50 cm. high, simple or branched with 1(-3) pairs of short sterile branches; internodes few, elongate. Stem leaves 10-15 mm. broad; intercalary leaves none. Inflorescence beginning at node 5-7. Flowers May-June.

   Area: Almost all Europe, except Spain, Italy and S. Greece; ? N. America.

   Two small forms and one with whitish corolla teeth are named.

   The British distribution is given by Sterneck (*l.c.*, 72 and 69) as: "York Shire Thirsk (Del.), Anglesey (Drc); *York*: Richmond (Drc.), *Schottland*: Arbroath (Drc.), Eddlesborough (Drc.)." [I reproduce this effort without comment: words in italic were in spaced type: Edlesborough is in Bucks. !]

2. ssp. *aestivalis* (Zinger, Herb. Fl. Ross. No. 2351) Soó.—f. *longiramosus* Poverlein, 1905, 15.

   Stem—60 cm. high, branched; branches 2-4 pairs suberect or erect-arcuate; internodes many, shortened. Intercalary leaves none or one pair. Inflorescence beginning at node 6-10. Flowers June-July.

   Area: as species.

   Specimens determined by Soó in Herb. C. E. Salmon are:—

   6, N. Somerset. Near Edington Junction, 23.8.1915, E. S. Marshall (No. 4201) as *R. major* v. *platypterus* (cf. *B.E.C. 1915 Rep.* (1916), 362, and *W.E.C. 1915/6 Rep.* (1916), 548).

   15, E. Kent. Sandhills between Deal and Sandwich, 15.6.1925, J. E. Lousley (62), as *R. major* ?,v. *platypterus* (see *W.E.C. 1926/7 Rep.* (1927), 390).

   105, W. Ross. Near village of Loch Carron, Aug. 1908, A. Wallis, as *R. major* v. *apterus*.

3. ssp. *polycladus* (Chabert) Zinger.

   Stem—60 cm. high, with many pairs of arcuate-ascending branches; internodes numerous, short or upper elongated. Stem leaves 8-15 mm. broad; intercalary (0) 1 (2) pairs. Inflorescence beginning at node 11-15. Flowers July-August.

Area as ssp. *serotinus.*

To this Soó refers only one sheet, viz.:—

90, Angus. Near Easthaven, Aug. 1916, G. C. Druce, as *R. major* (see *B.E.C. 1916 Rep.* (1917), 582; also 497, where Druce describes his plant as a new var. *angustifolius*—" Foliis angustis, 2-3 mm. lata.").

4. ssp. *serotinus* (Schönheit) Soó—*R. montanus* Sauter; *A. major* ssp. *montanus* (Sauter) Hayek.

Stem—60 cm. high, very much branched, with many pairs of arcuate-ascending branches; internodes many, short. Stem leaves 2-5 (-8) mm. broad, often acutely serrate; intercalary 2-5 (-10) pairs. Inflorescence beginning at node 15-20. Flowers August-September.

Area: Norway, Sweden, Denmark, Germany, Poland, Russia, Switzerland, Austria, Bohemia, Hungary, Rumania.

Soó identified as " *major* ssp. *montanus* (but not typical) " one of the sheets of E. S. Marshall's 4201 from N. Somerset, the other sheet of the same number being determined as ssp. *aestivalis* [q.v.]. The specimens are identical. Salmon adds a note: " You gave this *two* names . . . Are these synonyms ?," but to this query no answer is given. The omission of any mention of the British Isles in Soó's statement of the area might be significant were it not that no account has been taken of the specimen determined as ssp. *polycladus*, either.

§ grex *Borbasii* Soó.

A. Borbasii Dörfl., Herb. Norm. 1897, 3366 emend.—Stem leaves linear- or elongate-lanceolate, acutely serrate; teeth patent. Bracts elongated; teeth narrow, more aristate, spreading.

5. ssp. *Borbasii* (Dörfler) Soó. Diagnosis as above.

Area: S. Germany ?, Bohemia, Lower Austria, Hungary, Rumania, S. Russia, Asiatic Russia—Similar forms occur also in Britain, Fennoscandinavia.

Two sheets were so determined by Soó:—

88, Mid-Perth: Lawers, July 1883, H. T. Mennell, as *R. major* v. *stenoptera.*

96, Easterness: near Nairn, 12.7.1874, A. Ley, as *R. major* v. *apterus.*

§ grex *apterus* (Fries) Soó.

6. ssp. *apterus* (Fries) Schinz & Thell.—*R. major* v. *apterus* Fr. *R. Reichenbachii* Drejer p.p. [Soó does not state what the rest of Drejer's species was].—*A. apterus* (Fries) Ostenfeld.

Stem—50 cm. high, branched, with 2-5 pairs of obliquely erect branches, rarely unbranched; internodes few to many, shortened. Stem leaves 10-15 mm. broad; intercalary leaves none. Inflorescence beginning at node 6-10. Bracts often longer than the flowers. Flowers June-July.

Area: Britain (Scotland), Germany, France?, Denmark, Sweden, Poland, Russia.

The only gathering certified by Soó is that which is presumably intended in Sterneck (1901: 73) by "Garmouth (Drc.)," i.e.

95, Elgin: near Garmouth, 24.8.1898, E. S. Marshall, as *R. major* v.*aptera*, determined also by Ostenfeld as "*A. apterus* (Fr.) Ostf." Ostenfeld determines several gatherings in Herb. Mus. Brit. as *A. apterus* (Fr.) Ostf., but of one from 66, S.E. Yorks, he writes: "*A. apterus* (Fr.) with narrow-winged seeds." I do not cite these because: (1) the var. *stenopterus* Fr., with narrow-winged seeds, needs further investigation as it has been placed both under *major* and *apterus*, and (2) Soó has a note in Herb. C. E. Salmon:—"*Rh. major* var. *apterus* Ostenfeld = partim *Rh. major* typ., partim ssp. *apterus* Fries." Field observations on the development of the wing and of its variation in each locality would be valuable.

R. major × *minor*. Sterneck (1895: in *Öst. Bot. Zeitschr.*, 301) treats *A. minor* var. *fallax* Wimm. & Grab. (1829: *Fl. Siles*, II, i, p. 213) as being this hybrid (×*A. fallax* (W. & G.) Sterneck, 1901: 122), saying that in general appearance it is very like *A. minor* but differs in its larger corolla of which the tube partly exceeds the calyx, in the longer always violet teeth of the upper lip, in the black-striped stem [he does not there allow that *R. minor* ever has these striolations], and finally in the larger more spreading lower corolla lip. This last character made him wonder, he says, whether it might not be *A. lancêolatus* (Neilr.) Sterneck × *minor*, but the quite unawned bract-teeth are against this, and he therefore treats it as stated. He notes that a relatively high percentage (15%) of pollen is abortive. As in other instances, he has not seen any original specimens: his views are based on material collected by Haussknecht in Thuringen (Weissbach and Hohenfeld) and Alsace (Hoheneck). Wimmer and Grabowski (*l.c.*) describe their *A. minor* var. *fallax*, from Silesian material, as:—Taller, leaves and bracts broad, stem spotted, tooth of upper lip blue. They remark that it seems to be transitional to *A. major* but that it is not a transition, and that the spotted stem and violet corolla teeth are not to be considered as among the characteristic features of *A. minor*, as Wallroth wrongly insists.

Certainly in British *R. minor*, even in the strict sense, the stem may be striolate and the corolla teeth blue. Sterneck himself (1895: 301) says [translated] that "all other material which he has seen under the name [of var. *fallax*] in herbaria is always merely *A. minor* (Ehrh.) Wimm., with at most a violet tooth to the upper lip, which occurs fairly commonly in *A. minor*." Since the stem in *R. minor* can also be black-striolate, the only characters left to separate the variety are "taller" and "leaves and bracts broad," neither of which in any way indicate a hybrid with *R. major*. The hybrid should therefore be called "*R.*

major × *minor*," without any reference to "*fallax*" until the types have been investigated.

E. S. Marshall distributed three gatherings which he thought might be the hybrid. One of these is from: 6, N. Somerset: peat moor near Edington Junction, 6.7.1916 (No. 4371), with note—"fairly intermediate. Corolla appendage ± *patent* as in *R. major*. Stems black-striolate. New for Britain, I believe." The corolla tube is longer than the calyx and the determination seems possibly correct: both parents occur there.

The other two gatherings which I have seen so named are apparently merely forms of *R. minor*. That from 105, W. Ross, Duirinish, 9.7.1909, E. S. Marshall (No. 3375) has the corolla teeth as short as in *R. minor* and the lower teeth of the bracts no longer: Marshall's remark on the Somerset 1916 gathering indicates that he himself subsequently rejected the determination of this Ross plant as being the hybrid. The plants from 96, Easterness, Laggan Bridge, 24.7.1916 (No. 4252) show occasional more elongated corolla teeth, and the lowest bract-teeth are rather deep, but Soó has identified it as *R. Crista-galli* "f. *ramosus* Poverlein resp. f. *genevensis* Chab.," and at present it cannot be accepted as being the hybrid. It is much easier to recognise hybrids in the field than in the herbarium, but only when their respective parents and their variations are well known. At present the variations of *R. minor* are certainly *not* well known, and extreme caution is advisable on the subject of possible hybrids.

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SOME REDETERMINATIONS OF MELAMPYRUM SPECIMENS RECENTLY DISTRIBUTED BY THE B.E.C.

C. E. Britton, A.L.S.

In the *Journal of Botany*, lxxvii, pp. 81-84 (1939), appear determinations by Dr G. Beauverd of British forms of *Melampyrum pratense* L., several of which have been distributed through the B.E.C. in recent years, and it is desirable to draw attention to necessary changes of names. The numerals that follow indicate year and pagination of B.E.C. Report.

1932, 443.

M. pratense L. var. Wybunbury Moss, Cheshire, G. J. V. Bemrose. Identical with other gatherings from this locality, and referred to var. *paludosum* Gaud. subvar. *eu-paludosum* Beauverd.

1934, 977.

M. pratense L. var. *ericetorum* D. Oliv. Abinger Common, Surrey. My own examples are confirmed as var. *ericetorum* but as a new subvar. *decipiens* Beauverd. It is probable that the set distributed was mixed and also included var. *alpestre* subvar. *elongatum* Beauverd.

M. pratense L. var. *lanceolatum* Spenn. Chelsham, Surrey (Nos. 4127 A and B); Broxbourne, Herts. (No. 3641); Hosey [not Horsey as printed] Common, W. Kent (No. 4144). The Chelsham gatherings are placed to var. *ericetorum* D. Oliv. subvar. *decipiens* Beauverd, those from Broxbourne and Hosey Common are confirmed as *lanceolatum*.

M. pratense L. var. *commutatum* Schoenh. Felbridge, Surrey (coll. A. Beadell); Ottershaw, Surrey (coll. C.E.B.). Further study of both gatherings showed that the name assigned was untenable and the conclusions that the Felbridge plant was var. *integerrimum* f. *vogesiacum* Beauverd, and that from Ottershaw was var. *integerrimum* f. *pseudo-silvaticum* (Schur) Beauverd have been confirmed by Beauverd.

1935, 181-182.

M. pratense L. forma. Epping Forest, S. Essex. Suggested to be f. *divaricatum* and more definitely so identified, *B.E.C. 1935 Rep.*, 101. Beauverd refers examples to var. (or f.) *lanceolatum* Spenn., although he notes them as more or less approaching the Scandinavian f. *divaricatum* (Kern.) Ove Dahl.

M. pratense L. var. *concolor* Schonheit. Trottescliffe, W. Kent. Determined as var. *commutatum* (Tausch) Beck subvar. **pseudo-nemorosum** Beauverd, the latter name new to Britain.

M. pratense L. var. *digitatum* Schur. Shoreham, W. Kent. Confirmed by Beauverd.

M. pratense L. var. *lanceolatum* Spenn. Keston, W. Kent (coll. A. Beadell). Confirmed.

1936, 409.

M. pratense L. var. *ovatum* Spenn. Ranmore, Surrey. Confirmed.

1937, 661.

M. pratense L. var. *lanceolatum* Spenn. 12, N. Hants, near Eversley (P. M. Hall). My example of this is annotated by Beauverd "*M. pratense* var. *ericetorum* D. Oliv. forma ad subvar. *decipiens* Beauverd vergens: infl. initium ad VI um nodum situm! G. Beauverd, 10.x.38."

BOOK NOTICES AND REVIEWS.

The New Systematics. Edited by JULIAN HUXLEY. Pp. viii + 583. Oxford: Clarendon Press, 1940, 21/-.

German-English Botanical Terminology. An Introduction to German and English Terms used in Botany, including Plant Physiology, Ecology, Genetics, and Plant Pathology. By H. and E. ASHBY, H. RICHTER, and J. BÄRNER. Pp. xi + 175. London: Thomas Murby & Co., 1938, 10/-.

Recent Advances in Plant Genetics. By F. W. SANSOME and J. PHILP. Pp. xii + 412. J. & A. Churchill, Ltd., 1939, 18/-.

A Manual of Aquatic Plants. By NORMAN C. FASSETT. Pp. viii + 382. McGraw-Hill Pub. Co., Ltd., 1940, 26/-.

Wayside and Woodland Trees. A Guide to the British Sylva. By EDWARD STEP. Revised by A. Keith Jackson and A. Bruce Jackson. Pp. 186. Frederick Warne & Co., Ltd., 9/6.

An Ecological Glossary. Compiled by J. RICHARD CARPENTER. Pp. viii + 306 + xii. London: Kegan Paul, Trench, Trubner & Co., Ltd., 15/-.

The British Islands and their Vegetation. By A. G. TANSLEY. Pp. xl + 930 with 416 photographic illustrations and 179 text figures. Cambridge University Press, 1939, 45/- net.

To anyone interested in plants in the field, this book is certain to be a mine of information and a great source of pleasure. Its predecessor, the now scarce *Types of British Vegetation*, a partial work hurriedly put together for a special object, has long awaited a successor which should cover the whole field of the vegetation of the British Isles. That is the aim of the present work, which is fulfilled so far as the ecological investigations actually carried out permit. Every aspect of the country's vegetation is dealt with. From the first part the reader will obtain a good understanding of the variation in climate, geological rock and resultant soil, and other factors which determine the nature of the vegetation. The last chapter of this section deals with the effects of animals on vegetation. The second part summarises knowledge and views concerning the history of the vegetation since glacial times, and gives an outline of the types of vegetation (formations) and their distribution. In the third part the nature of vegetation itself is analysed, on the lines laid down by the famous American ecologist, F. E. Clements. In conjunction with the first part, this provides an excellent introduction to modern ecology. The numerous technical terms which have crept into the subject as they have proved to be required for the new concepts developed by this young and growing science are so clearly explained that they need not be too much feared by the general reader. Once the ideas to which they belong are properly grasped, they become as ordinary useful words as any others. The different methods which have been used to delimit and classify units of vegetation are explained.

Into the remaining three-quarters of the book are condensed the results of all important ecological work which has been done on the various British plant-associations and their constituents. It is possible that the general reader might have preferred to have the results of individual researches on certain subjects more completely digested into a single whole, but to the ecologist it may be an advantage that during the present growth phase of so young a subject premature fixations of ideas which generalised digests might involve have been avoided; the reader is thereby left more free to make his own observations assisted, but untrammeled, by the results of previous studies.

Part IV is devoted to Woodlands—their structure and status; the various oakwoods; beechwoods (on chalk and on sand); ashwoods; pine and birchwoods; alderwoods. Scrub vegetation is dealt with partly under the related woodlands and partly in a separate chapter concluding this section. The following parts deal with:—V: grasslands, their nature and status; grasslands on acid, basic, and neutral soils. VI: vegetation occurring in water and on saturated soils; ponds, lakes, rivers, fens, and bogs. VII: Heath and moor. VIII: Mountain vegetation. IX: Maritime and sub-maritime vegetation.

The whole work is an excellent compilation; all reading it will be sure to gain additional interest in and understanding of the plants met with during their excursions. The profuse photographic illustration is no doubt partly responsible for the price of the book, but greatly adds to both value and enjoyment. Any unevenness which may be perceived is mainly due to the fact that some areas and associations have received much more study than others. Scotland—and possibly also Ireland, with which I am less familiar—seems to me to be less adequately treated, but it has been less studied. The account of *Scirpetum caespitosi* shows evidence of a hasty effort made to fill in a gap, and *Molinia coerulea* and *Myrica Gale* are two other dominants so general in Scotland that they deserve better treatment and possibly higher status than they have received. But such inequalities will serve to indicate where further work is required.

The important part which Fungi play in the decomposition of vegetable debris, and their influence on the habitat in general, does not receive due attention from ecologists. Only in connection with the salt marshes of the Dovey estuary is this subject adequately mentioned in this book, although the well-known general and regular autumnal abundance of fungal growths in other associations indicate clearly how important is the rôle of these organisms in the general economy of Nature.

Another general criticism—of modern ecology rather than of this book—is that the lists of species given for the various communities too often show too great an ignorance of the general ecological requirements of individual species, requirements often well known to field-working systematists. Ecologists making such lists overlook the fact that a slight very local change in a habitat within " an association "—a depression, a hummock, and the like—bear species, really belonging to other " associations," which are too frequently listed where they do not belong, or with frequencies not belonging to the " association " for which the list is given. Much more ecological knowledge of individual species is required before these lists can have much objective significance.

What appears to be a serious blemish is the alphabetical order of names adopted in the lists of plants, of which neither systematist nor ecologist should approve, dispersing as it does such important ecological elements as grasses, Ericaceae, etc., and sometimes even mixing up mosses, etc., among flowering plants; it also makes the position of the species in the list dependent on the particular nomenclature adopted, which is not conducive to easy collation of lists, and the consistent use of *any* systematic order would have been preferable. Since some trouble has been taken with the nomenclature of the plants, the refusal to use the initial capitals of specific epithets where they are required by the International Rules of Botanical Nomenclature may also be regarded as arbitrariness undesirable in what must remain for many years a standard work, but these are small blemishes in such a valuable addition to the literature of the British Flora.

A. J. Wilmott.

Concise Flora of Britain for the use of Schools. With explanatory illustrations and keys to identification. By F. K. Makins. Pp. xxviii + 212. Oxford: Clarendon Press, 1939.

Welsh Ferns. By H. A. Hyde, M.A., and A. E. Wade, F.L.S. 8vo, pp. x + 131, frontispiece, 10 plates and 67 text figures. National Museum of Wales and Press Board of the University of Wales, Cardiff, 1940. Price 5/-.

This work, in which the Keeper and the Assistant in the Department of Botany of the National Museum of Wales have collaborated, is primarily intended to serve as a handbook to the native ferns of the Principality. Wales is well supplied with ferns, almost all the recognised British species being represented; descriptions of those not known to occur in Wales have been added, so that the book is in fact an up-to-date guide to the British fern flora.

The book is in two sections. The first contains general information on the life-history of a common fern; homosporous and heterosporous ferns; the organisation of the sporophyte, with special reference to shape, segmentation and venation of the frond; characters of the sorus and the sporangium, and a brief account of probable lines of descent, leading to criteria of classification, as formulated by Bower. This section terminates with an account of the various elements in the Welsh fern population, followed by a note on the collection of British ferns in the National Museum of Wales.

The remaining section, comprising about three-quarters of the book, is a descriptive catalogue of the species. Generic and specific keys are provided, and the illustrated description of each species is followed by the first Welsh record, distribution in Wales, the British Isles and the world, and a list of specimens in the Museum Herbarium. The arrangement followed has been adopted by the authors after consideration of the researches of Bower and, more recently, of Christensen. The most striking deviation from earlier standards occurs in the genus *Dryopteris*, restricted here to the six species of Buckler Fern (*D. Filix-mas*, *D. Villarsii*, *D. cristata*, *D. dilatata*, *D. spinulosa* and *D. aemula*). The Shield Ferns (*Polystichum*) are interposed between these and the remaining five species of *Dryopteris* of the 1928 *Plant List*. The latter are now distributed between two genera, *Thelypteris*, containing the Marsh, Mountain and Beech Ferns, and *Gymnocarpium*, which receives the Oak Fern (*G. Dryopteris*) and the Limestone Polypody (*G. Robertianum*).

Compared with the *Plant List*, the genera of British ferns has been increased from 21 to 23 (22 Welsh), whereas the species are reduced from 52 to 48 (40 Welsh) by the exclusion of three species of *Botrychium* and one of *Polystichum*. *Asplenium fontanum* is no longer regarded as British.

The photographic illustrations depict ferns *in situ* and detached fronds; the numerous line drawings are of great diagnostic value, and are mostly due to the fine work of Miss E. A. Jenkins. A list of collectors and a combined index and glossary conclude a work which will be of great value to the field-botanist, the teacher and to the country rambler who is in any way fern-conscious. May we hope that its authors will conspire with equal felicity to revise the remaining British species of *Pteridophyta*?

R. M.

Flora of Devon. W. KEBLE MARTIN and GORDON T. FRASER (Editors). Pp. xv + 787, with 8 plates and 2 maps. Arbroath: T. Buncle & Co. Ltd., 1939, 25/- net.

"Glorious Devon," the third largest county of England, has long been famous for its botanical treasures. Attractions of scenery and climate have further encouraged botanists in the investigation of the flora, and an enormous undigested mass of records had accumulated since the publication of Ravenshaw's "List" in 1860. The new Flora therefore fills a very obvious gap in botanical literature, and should receive an enthusiastic welcome from British field botanists.

It has been the custom for British County Floras to follow certain rather definite conventional lines, and in several important respects the present work differs fundamentally from the Floras of other counties.

Local Floras in the past have been essentially personal productions, usually the work of individual botanists, but occasionally that of two authors jointly. They have generally reflected the special interests of the writers in the form of comments and personal observations on the rarities and critical plants, and, while some outside help has generally been obtained, the strength and the weaknesses of the authors have been apparent throughout. Lt.-Col. Wolley-Dod's *Flora of Sussex* broke the tradition to some extent, but the new Devon Flora is the first to be essentially the work of a syndicate. Its nature was largely dictated by its history. In 1881 the Barnstaple Literary and Scientific Institution established a Botanical Record Committee, most of whose records and herbarium passed into the hands of W. P. Hiern. For many years this able botanist worked extremely hard on the flora of the county, and accumulated an enormous herbarium of Devonshire plants. In 1908 a Botanical Committee of the Devonshire Association was formed to keep systematic records of plants from the whole county, and their successors, the Botanical Section of the same Association, resolved on the production of a Flora in 1930 and carried the project through to publication. Besides the two principal editors, the assistance of the Rev. Thomas Stephenson and Mr Francis M. Day is acknowledged on the title page; of six other members of the Section on page ix; and of some 32 other botanists listed on page xi include others who have helped in writing up parts of the Flora. The authorities at Kew and the British Museum have also given very substantial help in this great " co-operative arrangement." The nomenclature of the Flora was revised by the authorities of the Royal Botanic Gardens, Kew.

The advantages of such widespread help are very great. The labour of compiling an accurate Flora of the size and standard of the one under review would very severely tax the energy and resources of an individual. The " co-operative arrangement " has made it possible to give more or less equal treatment to all groups of plants, however critical, and has produced a work unequalled amongst its kind for accuracy. Nevertheless, it must be admitted that in browsing through its pages one does sometimes feel the need for the " human " notes of a J. W. White, for the personality of a Druce, or for the occasional flashes of quiet wit which enlivened the pages of Salmon's *Flora of Surrey*.

The second distinctive feature of the *Flora of Devon* is the system of usually giving the localities " under the name of the parish only." The wisdom of this procedure is open to doubt. The authors do not state whether Ecclesiastical, Civil or Poor Law parishes are intended, and this may be very important in the area of the towns. In any case, surely the boundaries are subject to change? The size of the civil parishes varies from Lydford of 50,861 acres down to Newton Tracey of only 338 acres—and even smaller. Such variable units can therefore have very little scientific value in showing frequency.

Moreover, although Parish Boundaries are marked on the new Fifth Edition of the 1 in. Ordnance Survey, and have been marked on some old editions, they are not usually indicated on the maps used by botanists. Consequently, inaccuracies are unavoidable in entering up records. For example, discoveries quite correctly described as " Near A " or " Between A and B," may quite conceivably belong to Parish C. The editors claim that their system avoids " giving detailed directions to those who desire to have a short cut to the finding of our rarer treasures," but in the case of rarities they often proceed to add more detailed records! The writer has succeeded in finding many of the scarcer plants of Devon with far less detailed directions than those given within the pages of this Flora. It may be suggested that the most " accurate and scientific " method of citing localities is by means of the co-ordinates marked on every new Ordnance Survey map. Since this is open to the great objection that the whereabouts of every rarity is precisely indicated, the nearest satisfactory approach to accuracy is to publish records *exactly as written by the finders* with necessary editing in the case of rarities.

The third feature which distinguishes this Flora from all other British works is the manner in which it is soundly based on the herbaria of W. P. Hiern and others in the Royal Albert Museum, Exeter, of the Torquay Natural History Society, and of the Rev. W. Moyle Rogers. Material in these collections is duly indicated by appropriate marks against the records throughout, and no praise is too high for this innovation. It means that in the great majority of species, and especially critical species, any future workers wishing to confirm the records can go straight to the material on which they are based. In this manner the work will prove of great value to students of the wider aspects of British taxonomic and phytogeographical botany. One must bear in mind, however, that herbaria, however large and however carefully compiled, can never take the place of field work, and the syndicate responsible for the *Flora of Devon* have placed rather too much reliance on dried material. Botanists sometimes overlook the fact that even the best herbarium is accumulated by a very selective process. Thus, while it is obvious that if a given collection contains only one specimen of *Bellis perennis* and two of *Himantoglossum hircinum* the latter is not twice as common as the former, it is not always so obvious that the same selective process is often at work in the collection of more critical plants. The editors give an example of this principle on p. 223, where they remark that Herb. Hiern contains only 5 specimens of *Lathyrus montanus*, but no less than 11 of its " var." *tenuifolius*, which they, no doubt correctly, give as less common. Herein lies the danger of calling in specialists not familiar with the county to write up certain genera. It is likely, for example, that there are comparatively few sheets of *Salix alba* and *S. viminalis* in the herbaria simply because Hiern and others did not consider it worth while to continue collecting them. Similarly, *Rumex pulcher* is almost certainly much more common in Devon than the records indicate.

The first 61 pages of the Flora consist of introductory matter. The chapter on "Rainfall and Temperature" follows rather conventional lines. The selected figures give a general idea of the climate of Devon, but many more statistics of greater value for botanical purposes could have been printed in the same space. Thus, monthly tables for selected stations on the lines of those given in the appendix to E. G. Bilham's *The Climate of the British Isles* would enable botanists to assess conditions at the time of germination and fruiting for all species. Mere annual or seasonal averages, without monthly extremes, are of little value in the study of plant life. The expense of printing the large rainfall map is scarcely justified, and a geological map to assist readers in following the most excellent chapter on geology which follows would have been preferable. The table of " Southern Species in Devon," given on page 18, is a mixture of species which modern plant geographers assign to different groups. Reference should be made to Prof. J. R. Matthew's paper in the *Journal of Ecology*, xxv, 1-90, 1937, for a recent account of the rearrangement of plants formerly classed in Stapf's *Southern Element.*

The " Ecological Studies " which follow contain a great deal of very interesting information and their inclusion is amply justified. Nevertheless, their context is hardly up to the standard one would expect from the title. The writers have been quite content to treat their subject as non-dynamic, and there is little mention of succession or of the units under which ecologists classify vegetation. For Braunton Burrows reference should be made to Dr W. Watson's paper in the *Journal of Ecology*, 1918, for a valuable preliminary account on the right lines. Devon offers so many opportunities of fascinating ecological research that the editors of the Flora should have experienced no difficulty in obtaining help from leading ecologists. A preliminary study of the hydroseres of Slapton Ley, to take just one example, would provide the ideal conditions for a perfect summer vacation!

The recital of species extends to 700 pages, and the arrangement of entries is clear and orthodox. In view of the number of people involved in writing up the manuscript, inconsistencies are not numerous. Few field botanists, however, would expect to find *Sedum Fabaria* Koch and *Gymnadenia densiflora* Wahl. given specific rank in a work where that often misunderstood plant *Papaver Lecoqii* is treated as a variety of *P. dubium.* Aliens are printed in smaller type throughout, and even the most important of them receive only brief entries. Such well-established species as *Senecio Cineraria*, *Mimulus guttatus*, *Linaria arenaria*, *Rumex cuneifolius*, *Sagittaria rigida*, and *Digitaria Ischaemum* deserve considerably more space than has been devoted to them. That space might well have been obtained at the expense of some of the trivial varieties of native species which have been included.

The entries of the status and habitats of species have been compiled with great care and with fuller detail than is usual in local works. The entry of *Erodium dentatum* Bak. fil. and C. E. Salmon is puzzling. Baker and Salmon refer to *E. dentatum* Dumortier as a species likely to occur in Britain, but of which they had no records, and if this critical plant has now been found at Braunton is there any reason why it should be confidently described as an alien? Is *Oenanthe pimpinelloides* not to be found in dry limestone pastures in South Devon, does *Senecio eruci-*

folius not show a preference for the heavier soils, is *Leontodon hispidus* var. *hastilis* (L.) not an alien (if correctly named), and why are *Chara contraria* and *Tolypella glomerata* regarded as doubtfully native?

The records are divided first according to the two Watsonian vice-counties into which Devon is divided. This arrangement is a very wise one, and will prove a great boon to those entrusted with keeping *Topographical Botany* and *Comital Flora* posted up to date. The detailed account of the line dividing v.-cc. 3 and 4 published by W. P. Hiern in the *Transactions of the Devonshire Association*, 1909, should have been reprinted in the Flora for the benefit of those who are unable to obtain access to the original. The vice-counties are divided into three and five divisions respectively, and within the divisions records are arranged according to parishes. References to published records appear to be cited usually on the authority of the finder without reference to the place of publication. Our own Reports, when quoted, are cited only by years and usually without mention of pages, thus making the work of botanists wishing to refer to the original entries less easy.

The last line under each species deals with its distribution in neighbouring counties. In the case of the rarer plants, distribution elsewhere in Britain is sometimes included in the introductory matter to the species. Outside their own territory the authors are not evidently so well acquainted with plant distribution, and it is unfortunate that apparently they did not obtain assistance in connection with their extra-territorial notes. To take a few examples:—*Tulipa sylvestris* has at least two good stations in Dorset (in both of which I saw it growing in 1939); *Cyperus longus* is not extinct in Dorset; *Scirpus triqueter* grows also on the Shannon at Limerick as well as in the other localities loosely described as "S.E. England"; *Carex paradoxa* cannot be described as "a plant of East Anglia brecklands, etc." (although it happens to grow in a small fen within the area of the Breck, the statement ignores the widespread distribution on the eastern side of England); and *Euphorbia Peplis* is not extinct on the mainland of Cornwall.

The record of *Arctostaphylos Uva-ursi* on page 444 is a serious misquotation, and one can only assume that the editors had not themselves referred to the original record in the *Journal of Botany*, xi, 227, 1873. Here Nathorst records the discovery, in post-glacial deposits near Bovey Tracey, of ". . . some seeds and leaves of *Arctostaphylos Uva-ursi* Linn., which at the present time is not found in Britain to the south of York and Cumberland." In the *Flora of Devon* this record is first correctly treated as that of fossil remains and then incorrectly as an "alien casual" in the same paragraph!

On page 25 and again on page 568 it is suggested that Ley's record of *Rumex rupestris* from Braunton Burrows may have been an error for the alien *R. cuneifolius*. There is no justification for this since Ley collected the right plant on Sept. 14th, 1882, recorded it in *B.E.C. 1882 Rep.*, 76, 1884, and there is a specimen of the gathering in Herb. Mus. Brit.

It must be supposed that the use of the names *Scrophularia alata* Gilib. and *Salix repens* Linn. is deliberate. The account of *Carduus pycnocephalus* is confused: for a better statement of the facts reference should be made to *The Transactions of the Devonshire Association . . .*, lxxi, 243-247, 1939. It may be doubted whether the montane varieties *pratensis* and *sordidus* of *Leontodon autumnalis*, as usually understood in Britain, occur in Devon.

Omissions appear to be very few. There is no mention of the specimen of *Brassicella monensis* Huds. in Herb. Hiern collected by W. T. Wainwright at Woolacombe on June 23, 1909, which Mr Pugsley considers correctly named (*Journ. Bot.*, lxxiv, 326, 1936). In *B.E.C. 1937 Rep.*, 499, 1938, there is a record of *Chenopodium ficifolium* as found at Wolborough by G. T. Fraser, which is not included in the Flora.

At the end of the recital of species seven pages of " Addenda and Corrigenda " are inserted in a position where they are likely to be overlooked. A list of this length might well be expected in a Flora of this size, which takes many months to print, but the additions would be more conveniently included in the Supplement, which is believed to be now in preparation. Future workers would then have one less place to turn to in order to ascertain whether entries in the body of the work had been modified or corrected.

A Summary on page 768 shows that 1622 species, inclusive of aliens and casuals, are recorded in the Flora. This is followed by a concise and well-arranged chapter of Biographical Notices, and indices to the genera and popular names.

The map in the pocket at the end of the volume serves its purpose of indicating the arrangement of the Parishes, Sub-Districts and Districts, and is in keeping with the plan by which records are arranged. Lack of detail in the map makes it difficult to match it up with familiar country. The illustrations include an excellent view of Slapton Ley, five plant photographs of varying quality, and two plates reproducing drawings by the Rev. Keble Martin which are rather lost in their position in the book.

Printing and binding are all that one could wish for, and the rarity of mis-prints is most praiseworthy (the addition of an " e " in Le Gall's name on p. 711 should be noted).

It is to be regretted that criticism must almost inevitably bulk larger than praise in an unbiassed review of a scientific work. To say that part of a book is good takes a mere line; to say that a minor aspect is capable of improvement often necessitates a paragraph of explanation. For this reason there is a danger that the foregoing pages may give a false impression, and it must therefore be stressed that the new *Flora of Devon* is one of the finest, if not indeed the best, of all the local British Floras. Amateur botanists should be extremely grateful to the editors and all their band of helpers for the enormous amount of hard work which must have been entailed in the production of such a magnificent volume.

J. E. Lousley.

A Flora of Cambridgeshire. By A. H. EVANS. Pp. 223. Gurney & Jackson, 1939, 7/6.

A Supplement to the Yorkshire Floras. By the late F. ARNOLD LEES, edited by C. A. CHEETHAM and W. A. SLEDGE. Yorkshire Naturalists' Union. Pp. vi + 134. London: A. Brown & Sons, Ltd., 1942, 6/-.

The Vegetation of Craven in Wharfedale with its Adjacencies in Aire and Ribble. By F. ARNOLD LEES, edited by A. A. DALLMAN. Pp. 111. T. Buncle & Co. Ltd., 1939, 5/-. (Reprinted from the *North Western Naturalist.*)

A Flora of the North East of Ireland. By R. LL. PRAEGER and W. R. MEGAW. 2nd Edition. Pp. lix + 472, 3 maps. Belfast (The Quota Press), 1938, 10/6.

Botany of the Canadian Eastern Arctic. Part 1: Pteridophyta and Spermatophyta. By NICHOLAS POLUNIN. (National Museum of Canada, Bulletin No. 92.) Pp. vi + 408. Ottawa: King's Printer, 1940, 1 dollar.

Dr Polunin is well known in the northern hemisphere for his writings on, and explorations for, the plants of Arctic lands both in Europe and America. It is over ten years ago that he made his first botanical journey in Arctic Scandinavia, soon followed by researches in Labrador and elsewhere in the Canadian Arctic. His knowledge and enthusiasm were such that he undertook for the Canadian Government the work of which the present volume is the first of a series.

The area considered consists of all land in Canada north of the 60th parallel of latitude and east of 95° west longitude with a few exceptions on the western borders of the district. As the area is so immense, covering twenty degrees of latitude, it is divided into ten districts, fully described and depicted on a sketch map. An official map is provided as an end paper. Most of the land is bleak and inhospitable, often ice-covered, such as the interior of Ellesmere Land and Baffin Island, yet almost four hundred plant species are recorded and described. All, too, are apparently natives of the area; there are no adventives in this thinly-populated Eskimo land.

Further parts on " Thallophyta and Bryophyta, Vegetation and Ecology," and " Subarctic Regions " are in an advanced state of preparation. The author spent about a year studying herbarium material from the area in various Herbaria in America and Europe. Details of the whereabouts of the plants collected since botanical exploration began are given—this is invaluable to students—and a very full bibliography of the literature. A historical account of the various collectors in the area is followed by a list of localities at which collecting has been done. Each species found in the area is dealt with in a uniform manner. Name and synonyms are followed by a paragraph of general remarks on the plant in question, including systematic position and range of variation. Next comes the general distribution, followed by the distribution within the area. Habitat is carefully described with much ecological detail, from the author's personal observation. Lastly, a detailed citation of all records, arranged according to the subdivisions of the area, provides an invaluable summary of what has been accomplished in the past.

Dr Polunin takes responsibility for the nomenclature as he has revised the determination of all the herbarium material that he has seen and studied, and put his own unbiassed ideas into the task. He tends to be a " lumper " when treating the critical groups, preferring to rely on good appreciable differences between plants in conjunction with variations of distribution.

As over one hundred of the plants enumerated occur in Britain, mostly in Scotland, this work will appeal to those who are interested in plant distribution and ecology. Upon our highest mountains the conditions under which such plants as *Cerastium cerastioides*, *Saxifraga rivularis*, *Arctostaphylos alpina*, *Carex bipartita* and *C. rariflora* flourish must approximate very nearly to those pertaining in Baffin and about Hudson Bay. Does any British text-book tell us that the leaves of *Arctostaphylos alpina* turn to a " beautiful wine-red in autumn " and that they " persist for years in a withered condition "? Our *Salix myrsinites* of the Scottish mountains features the characters of retaining its withered leaves, which eventually decay to form humus. These notes are a joy to read and memorize for use in the field in Scotland when opportunities occur once more. This volume and those to come will be a standard work of reference for many years.

E. C. W.

ABSTRACTS FROM LITERATURE.

Compiled mainly by H. A. Hyde and A. E. Wade.

GENERAL.

(A) CYTOLOGY.

Effect of Colchicine.—Kostoff (1939) produced a polyploid condition in seedlings by growing them close to disintegrating pieces of *Colchicum* corm and hence suggested that polyploids should occur naturally in the neighbourhood of *Colchicum* colonies. Bates (1939) observed *per contra* that colchicine-induced polyploids produced in cultivation were stunted in comparison with normal plants and therefore in Nature would have been suppressed by competition.

General.—The Merton Catalogue (Maude, 1939) is a list of the chromosome numerals of all species of British flowering plants so far determined. It is the first such list for so extensive a flora. Out of 526 genera in the *London Catalogue* 444 have been examined; out of 2256 species 1302 have been counted, so that, apart from the great partially apomictic genera *Rosa*, *Rubus* and *Hieracium*, 670 species remain unexamined.

(B) GENETICS.

The Genetic Coefficients of Specific Difference.—From previous studies of closely related species it had been concluded that differences between such species are to be sought not in any one character but in harmoniously integrated tendencies (genetic coefficients) expressed more or less throughout the entire organism. A simple mathematical notation is developed for expressing the resulting morphological hiatus between two species.—Anderson and Ownbey (1939).

(C) BIOLOGY.

Development of Wood.—Knowlson (1939) investigated the anatomy of oaks which had continued to grow for 52 years after the bases of their original trunks had been buried 20 feet beneath quarry débris. New roots had arisen just below the new ground level and the amount of radial growth in the buried portion was much reduced, while the type of wood formed had changed significantly toward that characteristic of roots.

Photoperiodism.—Borgström (1939) has shown by experiment that in the violets no flowers are produced as a general rule when the day is shorter than 12 hours; a 13-15 hour day produces normal (chasmogamic) flowers while a 17 hour day gives cleistogamic flowers. The British species concerned were *Viola canina*, *hirta*, *odorata*, *palustris*, *Riviniana* and *silvestris*. Light is thrown on the phenomenon of the second flowering of some violets in autumn and on the occurrence of cleistogamic flowers in the summer. Cleistogamy is a conspicuous feature of the violets in northern countries, especially in Scandinavia.

POLLINATION AND FERTILISATION OF ROSES are discussed by Bolton (1940).

RESPIRATION.—Audus (1939 B) shows that the response induced by rubbing and bending of the leaf lamina is a widespread phenomenon in the leaves of angiosperms (including some British species), and points out that this sensitivity must have affected the results of past investigation on respiration, where considerable handling of material was a part of the methods used.

VIABILITY OF SEEDS.—The occurrence of buried viable seeds at different elevations and on a salt marsh is dealt with by Milton (1939); and the vitality of weed seeds by Brenchley (1939) and Hyde-Parker (1939).

THE WITHERING OF FLOWERS.—Livens (1939) considers that the function of the flower does not cease with the production of seeds, but that the withered flower serves to repel insects which might injure the ripening seeds, protects the seeds from the inclemencies of the atmosphere and results in diverting the current of vital elements from parts which no longer need them to organs which demand a large and rapid supply of nourishment. The withering of the flowers of a number of wild plants is described in detail.

(D) ECOLOGY.

Attention may be drawn here to the symposium on The Reciprocal Relationship of Ecology and Taxonomy referred to in more detail under the heading Taxonomy (p. 395).

GENERAL.—Richards (1939) would re-define ecology as the study of fluctuations in the density of animal and plant populations. The quantitative data so obtained if correlated with habitat factors should yield important taxonomic results.

AQUATIC PLANTS.—The effect of drastic interference with the vegetation of a large pool by dredging and subsequent recovery is discussed by Calder (1939).

LIMESTONE GRASSLAND.—Boley (1939) describes open downland vegetation near Bristol.

OAKWOODS.—Turner and Watt (1939) describe the "nearest approach in the British Isles to evergreen hygrophilous vegetation."

PEAT MIRES.*—The ecology of a raised (i.e. domed) bog—the first of its kind to be described in Britain—is dealt with by Godwin and Conway (1939). The vegetation is described under the various headings Lagg, River Terrace, Rand, Sphagnetum and Regeneration Complex, Scirpetum, Molinietum and Callunetum. The structure of the Regeneration Complex is substantially similar to that of other raised bogs in Sweden and elsewhere.

PLANT COMMUNITIES.—Tansley (1939 B) discusses what is the ultimate object of the synecologist's study, viz., the ecosystem, and summarises the outstanding work of the preceding 25 years from that point of view.

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*Mire (Swedish *myr*): a new term meaning any kind of peat land and also its characteristic vegetation (Godwin & Conway, 1939).

SALT-MARSHES.—Chapman (1939) has investigated the changes in the chloride, exchangeable sodium and calcium and moisture content in Norfolk salt-marshes.

SCREES.—Fenton (1939) discusses the progressive colonisation of screes.

SOIL ACIDITY.—Baker & Clapham (1939) demonstrated annual and monthly variations in acidity of three types of woodland soil; the changes were in part correlated with rainfall.

WEEDS.—The population of certain plots at Woburn Experimental Station has been studied in relation to cultivation and manuring by Mann (1939). The species chiefly concerned are *Spergula arvensis, Matricaria inodora, Poa annua, Stellaria media, Veronica* sp., *Polygonum aviculare, Gnaphalium uliginosum, Capsella Bursa-pastoris, Holcus mollis, Agrostis stolonifera, Rumex Acetosella, Equisetum arvense, Tussilago Farfara* and *Convolvulus arvensis.*

(E) POST-GLACIAL HISTORY OF BRITISH VEGETATION.

Pollen analyses of peat from three mosses on the Shropshire-Flintshire borders (Hardy, 1939) show that peat formation there began during Pre-Boreal time and continued into the Sub-Atlantic. Miss Hardy records two recurrence surfaces (grenze); and her diagrams exhibit marked parallelisms with those obtained by workers in Denmark, Ireland, England and Wales. A. R. & C. N. Clapham's (1939) Berkshire diagram (which has been zoned similarly) also begins with the Pre-Boreal but ends abruptly soon after the beginning of the Atlantic Period.

(F) PHYTOGEOGRAPHY.

IRELAND.—The origins of the Irish flora have been discussed by Praeger (1939). He regards a sea barrier even if narrow as a very serious obstacle to immigration; moreover the Irish flora does not contain, compared with the British, an undue proportion of species which could have been carried in by sea, winds or bird carriage: terrestial immigration is therefore indicated for the great majority. In regard to the effect of the Ice Age, Praeger is a survivalist. The Lusitanian Mediterranean plants came in overland probably by way of a south-westward extension of the existing land of the British Isles. The American group are more difficult to account for: probably they came by stages along the North Atlantic route, i.e. via Greenland, Iceland, etc. The break between Ireland and Britain came before that between Britain and Europe: hence the absence of many species which would otherwise have reached Ireland; but instances of restricted or discontinuous distribution are more difficult to explain. Work on quaternary floras promises to throw much light on these problems.

(G) TAXONOMY.

A symposium on the reciprocal relationship of Ecology and Taxonomy is published in the *Journal of Ecology* (1939). An introduction by Tansley is followed by a series of articles on various aspects of the question;

Richards deals with the use of ecological data in taxonomy; an appreciation and criticism of the taxonomist by an ecologist is given by Salisbury; Valentine discusses the advantages in using common species in investigating the relationship between taxonomy and autecology, using *Viola Riviniana* as an example; Diver deals with the measurement of ecological factors of use in taxonomy; Huxley with ecology and taxonomic differentiation, and Summerhayes and Turrill with the taxonomist's viewpoint of ecology and taxonomy.

Saunders (1939) deals with the neglect of anatomical evidence in the current solutions of problems in systematic botany.

BIOMETRICAL METHODS.—Melville (1939 C) describes the application of biometrical methods to the study of elms.

CLASSIFICATION OF DICOTYLEDONS.—Gundersen (1939) attempts an arrangement " more or less intermediate between the Rendle system and the Hutchinson system." He places the Dicotyledons in eight groups around eight genera, viz., *Magnolia*, *Ulmus*, *Cistus*, *Dianthus*, *Geranium*, *Myrtus*, *Ligustrum* and *Rubia*. The arrangement " does not claim to be phylogenetic;" and *Casuarina*, *Balanops*, *Myrica*, *Proteales*, *Santalales*, *Euphorbiaceae* and others have not been included.

INTERNATIONAL RULES OF BOTANICAL NOMENCLATURE.—Proposed additions and amendments are proposed by Sprague and others (1939 C).

SPECIFIC AND INFRA-SPECIFIC TERMS.—In studying population differentiation Gregor (1939) advocates the use of the following " specific " terms: *Coenospecies*, a population which is incapable of exchanging genes with other populations, even when given the opportunity. *Ecospecies*, a population with an inherently low capacity for exchanging genes with other populations of its coenospecies. The use of the following " infra-specific " terms is advocated for populations actually or potentially capable of freely exchanging genes: *Cline*, any gradation in measurable characters. *Topocline*, a cline following a geographical gradient. *Ecocline*, a cline apparently correlated with an observable ecological gradient. *Topotype*, a population in a geographical region possessing characters differing from those of another region. A topotype may be extraclinal if it does not fall within a geographical gradient in character expression, or intraclinal if it has reference to a particular range on a geographical gradient. *Ecotype*, a particular range on an ecocline. *Microtopotype*, a micro-geographical population primarily the result of a chance fractionation of a parent population. *Exotype*, a hereditary aberration which occurs so rarely and so sporadically that it never becomes a feature of any population: the category is therefore not a population concept.

SUBSPECIES AND VARIETY.—Reports of a discussion dealing with the use of the words subspecies and variety held at a meeting of the Linnean Society and arranged at the request of the Association for the Study of Systematics in Relation to General Biology are published in the *Proceedings of the Linnean Society* (1939) and in *Nature* (1939).

(H) TOPOGRAPHICAL.

British Isles.—Polunin (1939 A) gives an account and analysis of the vascular cryptogams native to Britain and now known to persist north of the 75th parallel of latitude and hence truly arctic in their affinities; he also gives an enumeration of these arctic plants (1939 B).

Great Britain.—Accounts of the distribution of *Potamogeton pusillus* L. and *P. Berchtoldii* Fieb. are given by Dandy & Taylor (1940).

Scilly Isles.—Notes on the flora of the Scilly Isles with a list of the species collected during 1938 are published by Lousley (1939 C). Twenty-three species, thirteen of which are adventive, and four varieties listed are new to the Scillies. Attention is drawn to the increasing resemblance between the flora of the Scillies and that of the Channel Islands. Lousley (1940) enumerates the more important records made during a visit in 1939, together with a few made during previous visits. Twenty-six species, nine varieties and two hybrids are given as new to the Islands.

Devon.—*The Flora of Devon* (Martin and Fraser; 1939) is reviewed elsewhere in this Report. Many additions and corrections to *C.F.* are necessitated, which are the subject of a special paper, p. 331.

Somerset.—Boley (1939) surveyed the grassland vegetation on Dundry Down.

North Somerset.—Skene (1939) gives a complete list of the plants recorded for Steep Holm.

Somerset and West Gloucestershire.—Sandwith (1939) gives an account of Bristol Botany in 1938. Three aliens new to Britain are recorded: *Carthamus oxyacantha* M. Bieb. and *Rumex stenophyllus* Ledeb. from Avonmouth, W. Glos., and *Aegilops ligustica* (Sav.) Cass. from the N. Somerset side of Bristol.

Wiltshire.—Grose (1939) gives a list of plant records for Wiltshire extending over several years. Eleven species are new to the county, the most interesting being *Gentiana baltica* Murb. from Bedwyn Common and *Antennaria dioica* (L.) Gaertn. from Morgan's Hill. Some topographical records and a considerable list of phenological records are reported by Aked-Davies (1939).

Essex.—A considerable number of new records which have accumulated between the years 1926 to 1939 are published by Brown (1939).

Norfolk.—Chapman (1939) continues his studies of Norfolk saltmarshes.

Warwickshire.—Bush (1939) gives an account of the grasses, sedges and rushes of the Tile Hill Nature Reserve.

Staffordshire.—Some additions to the Flora of North Staffordshire made during the years 1932-38 are given by Edees (1939).

Shropshire.—Dallman (1939) enumerates new records made during the year 1938.

Wales.—*Welsh Ferns* is reviewed elsewhere in this Report.

Cardigan.—Godwin and Conway (1939) have studied the ecology of Tregaron Bog.

DURHAM AND NORTHUMBERLAND.—Heslop Harrison (1939 A) discusses critical genera of plants that need study in the above counties.

Temperley (1939) discusses the history of *Stellaria glauca* in Durham, *Saussurea alpina* and *Polygonatum verticillatum* in Northumberland and includes details of recent discoveries.

NORTHUMBERLAND.—Notes on plants of Cheviot and the College Valley by Swan (1939).

NORTHUMBERLAND, DURHAM AND CUMBERLAND.—A list of the native plants of the three northern counties of England with introduction describing the general botanical features in relation to geology and scenery. The published Floras have been drawn upon. The critical genera are not intensively treated and there is scope for many more workers. A list of casuals is given as an appendix but no localities are quoted.—Harrison and Temperley (1939).

SCOTLAND.—Fairhurst (1939) summarises existing knowledge of the natural vegetation. Fenton (1939 A) records retrogression of heather and other species, which may be due to climatic change, and also (1939 B) describes scree vegetation in the Pentland and Moorfoot Hills.

ARGYLLSHIRE.—Watson has mapped the existing vegetation of Lorne, mid-Argyll, Knapdale and Kintyre and discusses the rôle of man in its recent development.

MID EBUDES (COLL).—Remarks on various plants of Coll are given by Harrison (1939 D). An account of the flora of Coll, Tiree and Gunna is given by Harrison, J. W., H. H., Clark and Cook (1940).

NORTH EBUDES.—A report of the Scottish Alpine Botanical Club Excursion to the Isle of Skye is given by Adam (1939). Lists of the more interesting plants seen are given. Clark (1939 B) records new stations for *Arenaria norvegica* Gunn. and *Thlaspi alpestre* L. on Rhum.

OUTER HEBRIDES.—Campbell (1939) contributes some notes on Outer Hebrides records. Clark (1939) records *Carex Halleri* Gunn. from North Uist, a new county record for v.-c. 110 and a considerable extension of its known range. Heslop Harrison (1939) gives an account of the Fauna and Flora of the Outer Hebrides. Heslop Harrison, J. W. and H., Cook and Clark (1939) give a list of plants from S. Uist, Eriskay and Fuday, new to or rare in the Outer Hebrides. Forty-one species are given as new vice-county records.—Watson (1939) and Wilmott (1939 A) contribute notes on the Flora of Barra. Four new vice-county records are given by Watson and one by Wilmott, who describes a new orchid as *Orchis hebridensis*, and a hybrid between it and *O. purpurella* as ×*O. hebridella*.—Various recent articles and plant records concerning the Isles are discussed by Harrison (1939 C). Noteworthy plants are recorded by Clark (1939 A), and by Clark and Harrison (1940). The results of recent expeditions to the Inner and Outer Hebrides are given by Harrison (1939 E) and (1940). Many interesting plants are recorded with helpful notes, many are new to the Islands.—Notes on some plants of Barra are given by Anon. in *Vasc.*, *25*, No. 4, 120.—Dandy and Taylor (1940, 139) give an account of the Potamogetons.

IRELAND.—The natural oakwoods at Killarney have been accurately described by Turner & Watt (1939). The outstanding feature of the woodland is the abundance and vigour of *Ilex Aquifolium*, *Calluna*, *Vaccinium Myrtillus* and of the cryptogams.

SYSTEMATIC.

6/33. RANUNCULUS FICARIA L. Metcalfe, C. R. (1939 A) discusses the sexual reproduction. The lack of viable seed is not due to lack of viable pollen but chiefly to various forms of degeneration in the embryosac or nucellus. It is shown that fertilisation is not a necessary preliminary to the formation of endosperm, and embryos sometimes arise from unfertilised eggs.

11/2. AQUILEGIA ALPINA L. Skalinska (1940) discusses the occurrence of the plant recorded under this name from Caenlochan, Forfar, and on the basis of a careful analysis identifies it as *A. pyrenaica* DC. Evidence against its being a native in Scotland is put forward.

21. PAPAVER. Arber (1938) gives an account of the morphology of the gynaecium. The evidence put forward favours the view that the gynaecium of *Papaver* consists of a single whorl of carpels, which are identical in type and are equal in number to the placentae and to the duplex stigmatic rays.

96. SILENE. Marsden-Jones & Turrill (1939) have continued their researches and publish an account of the genetics of petal size and other characters in *S. maritima* and the genetics of calyx-shape and other characters in *S. maritima*.

96/2(2)b. SILENE ANGUSTIFOLIA (Ten.) Gussone var. CARNEIFLORA (Legrand) Pugsl. Recorded by Pugsley (1940 C) from Plymouth Hoe, S. Devon.

98. LYCHNIS. The two coronal teeth of the petal are hollow lateral invaginations, corresponding in general structural type to the single median tooth in Boraginaceae.—Arber (1939).

112. HYPERICUM. Pugsley (1940 B) discusses the synonomy of the three square-stemmed species. The following names are adopted as valid:—*H. tetrapterum* Fr. (=*H. acutum* Moench—nomen illegitimum). *H. dubium* Leers (=*H. quadrangulum* of the *British Plant List*, ed. 2). *H. dubium* × *perforatum* (=*H. Desetangsii* Lamotte).

The variety of *H. dubium* Leers with pellucid-punctate leaves is referred to var. *perforatum* (Tourlet) comb. nov. *H. maculatum* Crantz is not *H. dubium* Leers and is not a British plant.

22. **Geraniaceae.** Warburg (1938) discusses the use of cytological characters as taxonomic criteria. In the genus *Geranium* the perennial species show polyploidy and the annual aneuploidy: the latter also occurs in two perennial species. In *Erodium* diploids and tetraploids occur in most of the subsections. The relationship of Geraniaceae, Oxalidaceae and Tropaeolaceae is confirmed as probable on cytological grounds. Balsaminaceae and

Limnanthaceae show certain cytological differences and are less closely related. The position of Linaceae and Zygophyllaceae is doubtful.

142/2. ACER CAMPESTRE L. Its value as an ornamental tree and for hedges is referred to by Gooch (1939).

150/1. CYTISUS SCOPARIUS (L.) Link. Variation in habit, size and colour of the flowers is described by Woolley (1939).

185. RUBUS. Crane and Thomas (1939) show that many of the species and microspecies in this genus are clones and subclones produced by segregation and maintained by a sexual reproduction.

194. ROSA. Diploid lines of descent related to the polyploid appear to have been always present. Hybridisation of hexaploids with related diploids followed by the elimination of unpaired chromosomes in the descendants has been important in promoting the appearance of polymorphic diploid races with novel characteristics.—Erlanson (1938).

195. SORBUS. Wilmott (1939 C) deals with the typification of *Sorbus porrigens*, *S. anglica*, and *S. rupicola*.

197/1. COTONEASTER INTEGERRIMA Medik. Pugsley (1940 E) refers to a record of the species from Benderloch, Argyll, printed in the 7th edition of Bentham & Hooker's *Handbook of the British Flora*, by the late Dr A. B. Rendle (1930). It seems that the record is a misidentification of *C. microphylla* and should be ignored, unless an authentic specimen can be produced. Wilmott (*J.B.*, *78*, 199, 1940) reports that he has received specimens of both *C. microphylla* and *C. Simonsii* from the Benderloch locality.

277/2. HERACLEUM SPHONDYLIUM L. An account of the occurrence of multi-perforate plates in the xylem vessels is given by Majumdar (1939).

284/1. HEDERA HELIX L. var. CONGLOMERATA as a rock-garden plant.—Anon (O.C.) (1939).

45. **Caprifoliaceae.** A study of the pericycle is given by Cooper (1939).

339. AMBROSIA. F. Vignolo-Lutati (1939) discusses the identity and relationship of *A. artemisifolia* L. and *A. elatior* L. He finds that it is not possible to interpret the Linnean diagnoses in the light of the material available, and proposes to adopt the interpretations given by Rydberg in *N. American Fl.*, 33, i, 1922, which have the merit of fitting two recognisable entities. This being allowed, he finds that the plant found commonly in Europe should be identified with *A. elatior* L. sens. Rydberg. Similarly he discusses the relationships of *A. psilostachya* DC. and *A. coronopifolia* Torr. et Gr., and finds that Italian material should be referred to the former, although the latter probably also occurs. It seems unfortunate that a request for photographs of the Linnean types was apparently unsuccessful.

341(2)/1. SIEGESBECKIA ORIENTALIS L. recorded from a second station in Lancashire by Hardy (1940 B).

395. CARDUUS PYCNOCEPHALUS L. and C. TENUIFLORUS Curt. Howell (1939) reports that both species are naturalised in northern California and gives a synopsis of the characters distinguishing them. He lays special stress on two characters found in the phyllaries.

395/3. CARDUUS PYCNOCEPHALUS L. Phillips (1939) deals with the occurrence of this plant on Plymouth Hoe and with the distinction between it and *Carduus tenuiflorus* Curt.

425. LACTUCA. G. L. Stebbins, Jr. (1939) has notes on *L. tatarica* (L.) C. A. Mey. subsp. *pulchella* (Pursh) Stebbins "comb. nov.," and notes (with a key) on the distinctions between *L. virosa* L., *L. Scariola* L., *L. Scariola* L. var. *integrata* G. et G., and *L. saligna* L.

471/1. FRAXINUS EXCELSIOR L. The presence of three abortive ovules on the abnormally long stalk of the seed suggests that this stalk is, for the greater part, not the funicle but the placenta which has broken away from the top of the ovary.—Hilary (1939).

486/1. POLEMONIUM CAERULEUM L. Soueges (1939) describes the development of the embryo, which confirms the affinity of *Polemoniaceae* with *Solanaceae* and *Boraginaceae* and justifies their place in the Order Tubiflorae.

515. CUSCUTA. Self-parasitism is reported by Audus (1939).

539/1. LIMOSELLA AQUATICA L. Chromosomes $2n = 40$.—Blackburn (1939).

539/1(2). LIMOSELLA SUBULATA Ives. First noticed at Kenfig Pool, Glamorgan, in 1901 by Marshall and Shoolbred, but mistaken for *L. aquatica* var. *tenuifolia* Lej. Subsequently Prof. Glück of Heidelberg identified the plants from Kenfig, Crumlin Bog and Morfa Swamp, Glamorgan, and from Glaslyn River, Merioneth, as *L. subulata* Ives.—Vachell (1939). Blackburn (1939) records the chromosome number of plants from Morfa Swamp as $2n = 20$ and records a hybrid from the same locality between *L. aquatica* and *L. subulata* with a chromosome count of $2n = 30$.

541/1. DIGITALIS PURPUREA L. Berkeley (1939) describes a bifurcated inflorescence. The abnormality is shown to be associated with fasciation and the nature and cause of the flattening and forking of the stem are discussed.

545. EUPHRASIA. Additional vice-comital records are given by Pugsley (1940 A).

548. RHINANTHUS. Wilmott (1940) gives the results of a revision of the British material in the British Museum Herbarium. The following new species and varieties are described:—*R. calcareus*, *R. spadiceus* (this is the British plant erroneously called *R. monticola*), *R. spadiceus* with a subsp. *orcadensis*, *R. borealis* var. *calvescens*, *R. Lintoni* and *R. lochabrensis*.

549/3. MELAMPYRUM PRATENSE L. Britton (1939) gives a detailed account of the determinations made by Dr G. Beauverd of a large collection of specimens. Some plants are considered sufficiently distinct to warrant the application of distinctive names. These are dealt with in this Report under Plant Notes.

550/7. OROBANCHE HEDERAE Duby. Thompson (1939 B) deals with the occurrence of this plant in and about Bristol and considers it much commoner on ivy-covered walls in Bristol and several small towns in N. Somerset than in the wilder districts of Somerset, even where ivy is abundant.

588. PLANTAGO. Davy and Lang (1939) examined samples of 102 plants each of two races of *P. maritima* L. and one of *P. serpentina* All. for all possible direct correlations of twenty characters. Various intensities of growth showed the effect of size on different organs. The habit of the scapes was associated with time of flowering, decumbent types tending to be earlier than erect types, and with scape length where erect types tended to be longer than decumbent.

Gregor (1939) deals with population differentiation in North American and European Sea Plantains allied to *Plantago maritima* L.

588/5. PLANTAGO MARITIMA L. Gregor (1938) deals with the distribution in Britain and initial population differentiation. Differentiation is most marked for growth-habit and size characters, such as the habit and size of the scapes and the leaf dimensions. Three ecotypes are named, *decumbens*, *ascendens* and *erecta*, and one geo-ecotype, *immaculata*.

588/8. PLANTAGO LANCEOLATA L. Hope-Simpson (1939) gives some observations on forms with a reduced number of stamens. The occurrence of a reduced andraecium appears to be correlated with lateness of flowering. In five of the twenty-five plants with reduced number of stamens the corolla lobes remain more or less converged.

618/2(2). RUMEX AQUATICUS L. as a British plant is dealt with by Lousley (1939 A). It is shown that *R. aquaticus* L. is distinct from *R. domesticus* Hartm. and *R. Hydrolapathum* Huds. with which it has been confused in the past. In Britain it is known only from the shore of Loch Lomond in Stirlingshire.

628. EUPHORBIA. F. D'Amato (1939) discusses the embryology and caryology of certain species, including *E. Paralias* L. and *E. amygdaloides* L.

633/4(2). ULMUS DIVERSIFOLIA Melville sp. nov. The East Anglian Elm is described under this name.—Melville (1939 A).

649/1. FAGUS SYLVATICA L. The early growth of seedlings under natural and experimental conditions is dealt with by Harley (1939). From the experiments it appears that shading of seedlings produces symptoms similar to those found in seedlings under woodland conditions. These are:—1, Great water content. 2, Poor root growth. 3, Low dry weight. 4, Low root shoot ratio (dry weight). 5, Incomplete mobilization of nitrogen before the fall of cotyledons. 6, A very small or complete lack of absorption of nitrogen.

A fungus isolated from "pyramidal" type of beech mycorrhiza is described and considered to be *Mycelium radicis Fagi* (Chan.). The slow growth of this fungus in pure culture is stimulated by an extract of beech roots, for which a method of preparation is given.—Harley.

650/3b. SALIX ALBA L. var. CAERULEA (Sm.). A detailed description of the anatomy of the wood of the cricket-bat willow is given by Metcalfe, G. (1939).

650/3d. SALIX ALBA L. var. ELYENSIS Burtt Davy. This new variety is described by Burtt Davy (1938) and is reported from Norfolk and Hampshire.

652/1. EMPETRUM NIGRUM L. The flowering and systematic position of this plant are discussed by Blackburn (1939).

91. **Orchidaceae.** The address to the Botanical Section of the Congress of the South-Eastern Union of Scientific Societies by Hall (1939) was devoted to a discussion of the hybrid wild orchids of Britain. Crosses are far commoner in temperate than in tropical vegetation. Microscopic examination is often required to determine the origin of an orchid.

An account of orchids hardy in Britain is continued by Darnell (1939). Figures of the flowers are given. The following British orchids are dealt with:—*Ophrys Trollii* Heg., *Orchis elodes* Griseb., *O. Fuchsii* Druce, *O. incarnata* L. (=*O. latifolia* L. sec. Pugsley), *O. latifolia* auct. angl. (=*O. pardalina* Pugsl.) and *O. laxiflora* Lam.

668/3(3). EPIPACTIS VECTENSIS (T. & T. A. Stephens.) Brooke & Rose. *Epipactis leptochila* Godf. var. *vectensis* Stephenson is raised to specific rank by Brooke & Rose (1940).

669. ORCHIS. The results of the examination of the exsiccatae of the Dactylorchids in the Botanical Museum of the University of Copenhagen together with other relevant information are given by Pugsley (1939 A). The chromosome numbers as published by Hagerup, Vermeulen and Heusser are given as follows:—*Orchis latifolia* L. (*O. incarnata* auct.), with var. *ochroleuca* Boll., *O. cruenta* Müll., *O. maculata* L. var. *Meyeri* Rchb. f. and *O. foliosa* Soland. are diploid species, with the chromosome number $2n = 40$, while *O. majalis* Rchb., with subsp. *occidentalis* Pugsl., *O. purpurella* Steph., *O. praetermissa* Dr., with subsp. *junialis* Verm., *O. sesquipedalis* Willd., *O. Munbyana* Boiss. & Reut., and *O. maculata* L. var. *genuina* Rchb. f. and var. *elodes* (Griseb.) Camus, are tetraploids ($2n = 80$). Different plants referred to as *O. Traunsteineri* Saut. give

varying results, $2n = 40$, $2n = 80$, and $2n = 122$. *O. majalis* subsp. *Traunsteineroides* Pugsl. is tetraploid ($2n = 80$). The hybrids *O. latifolia* × *maculata* have the chromosome number $2n = 60$.

Pugsley (1940 F) describes the distribution of *O. pardalina* Pugsl., *O. praetermissa* Druce and *O. maculata* L. (*O. Fuchsii* Druce) in Cornwall and South Devon and concludes that no ground exists for supposing *O. pardalina* to be a hybrid *O. maculata* (*Fuchsii*) × *praetermissa* and obviously not *O. ericetorum* × *praetermissa*.

The Wicklow orchid is raised to the rank of species as *O. Traunsteinerioides* Pugsl. and the form of *O. maculata* L. growing at St Ives, West Cornwall, is described and figured as var. *cornubiensis* Pugsl.

669. Orchis mascula L., O. latifolia L., Gymnadenia conopsea (L.) R. Br. Burges (1939) investigates the defensive mechanism in orchid mycorrhiza and states that fungal infection of a mycorrhizal type is usually limited to the roots. Two types of resistance are recognised, a mechanical resistance in the form of wall thickenings and cuticularisation and a protoplasmic resistance. In the latter there is a complete breakdown of the invading fungus. During the breakdown of the fungus, histological changes can be observed; these have been correlated with a loss of vitality in the endophyte. The vitality of the endophyte at different stages has been tested by dissecting out the hyphae by means of a micromanipulator and transferring the hyphae to agar. Plasmolysis experiments have also been used. Bernard's observation that a toxic material exists in the tubers has been confirmed. Using micropipettes, a toxic material has been isolated from the cells in which the fungus is undergoing digestion.

669/6. Orchis pardalina Pugsl. Recorded from North Staffordshire by Edees not in association with *O. praetermissa*.

669/11(2). Orchis hebridensis Wilmott (1939 B: 192) is described as a new species, from Barra, v.-c. 110.

669/11(2)×9. ×Orchis hebridella Wilmott. Under this name Wilmott (1939 B: 193) describes the hybrid between *Orchis hebridensis* and *O. purpurella* from Barra, v.-c. 110.

669/14. Orchis mascula L. The development of the sinker is described by Sharman (1939).

669/18. Himantoglossum hircinum (L.) Koch. Sledge (1939) records the occurrence of the Lizard Orchid in Yorkshire and gives a brief history of its occurrence in Britain.

678. Crocus L. Fritsché gives some account of the morphology, seed dispersal (by ants) and germination.

684/1. Narcissus pseudo-narcissus L. The anatomy of flowers and leaves of normal plants and plants grown on a horizontal klinostat are compared. In the flowers growth on a klinostat does not affect the development or distribution of statocytes, but changes occur in the shape and size of cells of the outer tissues of peduncle and receptacle. In leaves the cells of epidermis and palisade tissue are smaller in transverse section and epidermal cells are shorter longitudinally than in upright plants. The average number of stomata per sq. mm. is greater.—Brain.

684/4. NARCISSUS POETICUS L. The spermatogenesis as observed *in vivo* is described by Kostrinkova and Benetskaia.

684/7. NARCISSUS MINOR L. Considered by Pugsley (1939 B) to be a native of Portugal.

684/9. NARCISSUS INFUNDIBULUM Poiret. Pugsley (1939 B) identifies the Cornish plant, previously called *N. odorus* L., as this species.

688/1. TAMUS COMMUNIS L. Burkill (1939 A) gives a fuller account of his experiments and observations on the trigger mechanism in the germination of the seed. He also describes the growth and tensions between the nerves in the leaf blade (1939 B). Burkill (1940) describes the distribution of raphides in the leaves.

716/1. PARIS QUADRIFOLIA L. The frequency of the occurrence of the five-leaved variety is discussed.—Stearn et al. (1939).

727/1. LEMNA MINOR L. An account is given of the effect on growth and assimilation of all combinations of four light intensities and four levels of potassium supply under controlled conditions by White (1939).

737. POTAMOGETON. Dandy and Taylor (1940, 139) give an account of the species occurring in the Outer Hebrides. Ten species are recorded.

737/3. POTAMOGETON DRUCEI Fryer. This is shown by Dandy and Taylor (1939) to be identical with *P. nodosus* Poir. The vice-county distribution is given as 6, 9, 22, and 34. Vice-county 8 given by Druce in his *Comital Flora* is an error for " 6."

737/23. POTAMOGETON BERCHTOLDII Fieb. Dandy and Taylor (1940, 49) give an account of the distribution in Britain with references to all the specimens examined.

737/25. POTAMOGETON PUSILLUS L. Dandy and Taylor (1940, 1) give an account of the distribution in Great Britain and include references to all specimens examined.

740/1. ZOSTERA MARINA L. Tutin (1938) gives a brief account of the taxonomy, a detailed account of the autecology and some account of the epidemic disease responsible for its extensive mortality.

740/1(2). ZOSTERA HORNEMANNIANA Tutin. Tutin (1938) gives some account of the autecology.

750/1. CLADIUM MARISCUS R. Br. Conway (1938) continues studies in the autecology and gives an account of the growth rates of the leaves and of the distribution of the species in Europe. Von Post's interpretation of its distribution is confirmed by experimental evidence. This interpretation is that the species is benefited by high summer temperature (a mean of 14-16° C. in the warmest months), that the growing point of the stem is frost sensitive, and that the species is excluded from localities where frost is so intensive that it can penetrate to the underground regions of the plant.

753/49(2). CAREX EBORACENSIS Nelmes. Nelmes (1939) describes this from Copgrove, near Knaresboro, Yorkshire, collected by the Rev. James Dalton in 1802.

753/59. CAREX VULPINA L. This name has been applied to two distinct species, one with an eastern and the other with a western distribution. Nelmes (1939) shows that the eastern plant is the true *C. vulpina* L. and is rare in Britain, whilst the common British plant with a western distribution is *C. Otrubae* Podp.

758/3. SPARTINA TOWNSENDII H. & J. Groves. A detailed account of the structure and development of the hydathodes is given by Skelding and Winterbotham (1939).

791. DESCHAMPSIA FLEXUOSA (L.) Trin. An arctic Russian form of this species was subjected to a ten hour day (by covering except between 8 a.m. and 6 p.m.). Normal reproduction was suppressed owing to increased vegetative growth of the tuft and the formation of shortened viviparous panicles. Transitional forms were obtained, from normal floriferous spikelets through vegetative buds to normal vegetative shoots. It is concluded that vivipary is not a congenital and invariable autonomous property of certain genotypes, but a result of interaction of the hereditary material constitution of the organism with definite conditions of existence.—Schultz (1939).

829. LOLIUM MULTIFLORUM Lam. and L. SUBULATUM Vis. Plants were subjected to starvation conditions in a dark room at 16° C. and harvests made at intervals over a period of 15 days. Analyses were made of this material. It was found that protein sulphur decreased in amount in the leaves and was accompanied by a corresponding increase in sulphate sulphur. No ethereal sulphate could be detected and the amount of soluble organic sulphur did not alter appreciably. In the leaves protein nitrogen decreased, but was not accompanied by an increase of soluble nitrogen compounds. In the stems *plus* roots the amounts of protein sulphur, protein nitrogen and sulphate sulphur did not change appreciably during the experiment, but the soluble nitrogenous compounds increased in amount owing to translocation from the leaves.

The value of the ratio of protein nitrogen to protein sulphur did not alter appreciably in either leaves or stems *plus* roots.

It is concluded that during protein katabolism in leaves protein sulphur is oxidised, probably by way of cystine, to inorganic sulphate sulphur.—Wood and Barrien (1939).

841/1. Pinus sylvestris L. Pratt (1939) deals with the fertilisation.

844/2. Equisetum arvense L. Taylor (1939) discusses the early cellular and axial organisation of the embryo, prothallial nutrition, the segmental organisation of the adult plant, and some features of the organisation of the sporophyte. *E. arvense* is considered to be one of the most primitive of the Pteridophyta.

844/8. Equisetum trachyodon Braun. Matthews (1940) records its occurrence in South Aberdeenshire near the Bridge of Potarch, Birse.

847/1. Pteridium aquilinum (L.) Kuhn. The occurrence of Bracken in London is dealt with by Lousley (1939 B) and Ridley (1939), and in Bristol by Thompson (1939 A).

854/3. Polystichum aculeatum (L.) Roth. Alston (1940) discusses the correct application of the name and shows that it is the correct one for the plant known as *P. lobatum* (Huds.) Woynar. *P. angulare* (Kit. ex Willd.) Presl should be called *P. setiferum* (Forsk.) Woynar.

856/1. Dryopteris Filix-mas (L.) Schott. Manton (1939) finds that the "type" of this species is a sexually reproducing tetraploid ($2n = 160$); its var. *abbreviata* (which also reproduces sexually) is diploid in its sporophyte ($2n = 80$) and haploid in the gametophyte (n = 40-41), while var. *paleacea* (which is apogamous) may be diploid, triploid or tetraploid. The author would regard the three groups named as distinct species.

856/5. Dryopteris aemula (Ait.) Kuntze. The occurrence of this fern at Hackness in Yorkshire is dealt with by Rowlands (1939).

112. **Ophioglossaceae.** A monographic survey of the Ophioglossaceae of the world is made by Clausen (1938).

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PUBLICATIONS FOR SALE (Continued).

SYSTEMATIC.

	s.	d.
Extinct and Dubious Plants of Britain. Druce (1919)	2	6
The British Forms of Ranunculus acer L. Drabble (19[illegible]0)	1	6
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Euphrasia. Pearsall (1925)	1	0
Menthae Britannicae. Fraser (1926)	2	6
Notes on Mentha. Fraser (1930)	1	0
The British Species and Forms of Thymus. Ronniger (192[illegible])	2	0
Teratological Forms of Plantago lanceolata. Flintoff (1930)	1	6
Two varieties of Ulmus glabra. Lindquist (1931)	1	6
Explanation of the Salix list in the London Catalogue. Fraser (1925)	1	[illegible]
British Orchids in 1930. Hall (1930)	1	[illegible]
Orchis maculata and O. Fuchsii. Druce (1923)	1	0
Orchis latifolia. Druce (1922)	1	0
N.W. European Juncus alpinus forms. Lindquist (1930)	2	6
Potamogeton. I. Pearsall (19[illegible]). II. Pearsall (1930). Two Parts	2	6
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Carex microglochin. Druce (19[illegible]3)	0	6
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Dunn. Alien Flora of Britain, XVI, 20[illegible]. 19[illegible]	[illegible]	[illegible]
Irvine. The London Flora, XVI, [illegible]. 183[illegible]	[illegible]	0

B.E.C. PUBLICATIONS

To be obtained from the Acting Secretary, Mr A. J. WILMOTT,
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REPORTS: Prices on application.

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Adventive Flora of the Port of Cardiff. Wade & Smith (1925)	1	[illegible]
Adventive Flora of Burton-upon-Trent. Curtis (1930)	1	[illegible]

(Continued overleaf.)

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

REPORT FOR 1939

OF THE

BOTANICAL EXCHANGE CLUB

(CONVENIENTLY ABBREVIATED B.E.C. 1939 REP.)

BY

THE DISTRIBUTOR,

N. DOUGLAS SIMPSON, Esq.

VOL. XII. PART IV.

PRICE 5s.

PUBLISHED BY
T. BUNCLE & CO. LTD., MARKET PLACE, ARBROATH

December [illegible]

NOTICES TO MEMBERS.

APPLICATIONS FOR MEMBERSHIP.

Applications for Membership should be sent to the Acting Secretary, Mr A. J. Wilmott, Natural History Museum, Cromwell Road, London, S.W.7.

SUBSCRIPTIONS.

Subscriptions should be paid to the Treasurer, Mr J. E. Lousley, at 7 Penistone Road, Streatham Common, S.W.16. The Annual Subscription for Ordinary Members is Ten Shillings, payable on the 1st of January annually. Owing to the enforced restriction of the activities of the Society the Committee have decided that this should be reduced to Five Shillings per annum for the years 1941, 1942, and 1943. Some members have generously offered to continue payment at the old rate. Exchange Members need subscribe only at the same rate as Ordinary Members during the period when the distribution of plants is in abeyance.

MATERIAL FOR THE NEXT REPORT.

Material for the next Report—Records, Notes, etc.—should be sent to Mr A. J. Wilmott, as Mr E. C. Wallace has now joined H.M. Forces (R.A.F.).

SPECIMENS FOR IDENTIFICATION.

Ordinary Specimens for Identification may be sent to the Acting Secretary. Before sending critical material to the Society's Referees (see 1937 Report, 639-646), members should first ascertain from the Referee concerned whether he is in a position to determine specimens, as in existing circumstances any temporarily emended list is liable at any time to become inaccurate.

PAST REPORTS REQUIRED

to improve the Society's stock:

1879, 1886, 1903, 1909.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. XII. PART IV).

Victoria Regina.

Floreat flora.

REPORT FOR 1939

OF THE

BOTANICAL EXCHANGE CLUB

(Conveniently Abbreviated B.E.C. 1939-40 REP.)

BY

THE DISTRIBUTOR,

N. DOUGLAS SIMPSON, Esq.

Printed by T. Buncle & Co. Ltd., Market Place, Arbroath.
December 1942.

REPORT OF THE DISTRIBUTOR FOR 1939.

Owing to the war the number of specimens sent in for distribution was very small. On this account it is the more regrettable that about a sixth of the gatherings were of common non-critical plants. Others were collected at too young a stage for certain identification beyond the rank of species. Some collectors do not furnish their specimens with a reference number: citation is more simple when such a number is present.

If members would refrain from sending in plants under names they know to have been superseded a good deal of expense and correspondence would be saved.

Many of the specimens were carefully chosen, beautifully prepared and accompanied by most useful notes.

The following botanists have earned the gratitude of the Club for the trouble they have taken in examining specimens and supplying notes:—A. H. G. Alston, C. E. Britton, J. E. Dandy, Prof. R. Ruggles Gates, P. M. Hall, C. E. Hubbard, J. E. Lousley, Dr R. Melville, E. Nelmes, H. W. Pugsley, A. L. Still, Dr G. Taylor, Dr D. H. Valentine, Dr E. F. Warburg, and A. J. Wilmott.

N. Douglas Simpson.

Maesbury, Cavendish Road,
Bournemouth, December, 1940.

LIST OF CONTRIBUTORS.

	Sheets.	Gatherings.
C. E. Britton	22	2
G. C. Brown	127	9
J. D. Grose	97	8
P. M. Hall	53	5
J. W. Long	90	6
N. D. Simpson	32	2
W. A. Sledge	68	6
National Museum of Wales	126	10
E. C. Wallace	144	10
	759	58

A number of duplicates from the Herbaria of E. C. Wallace and the Distributor were also included in the parcels.

Aconitum anglicum Stapf. 41, Glamorgan; banks of the River Ely, near Peterston-super-Ely, May 1939.—Coll. E. P. PERMAN; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Diplotaxis tenuifolia (L.) DC. 41, Glamorgan; banks by the mouth of the River Ely, Grangetown, Cardiff, June 1938.—Coll. A. E. WADE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Viola hirta L. × *odorata* L. = *V. permixta* Jord. (Ref. No. 2538.) 26, W. Suffolk; Brent Eleigh, April 10th, 1939. Plants strong and flowers very large and deeper violet than in *V. hirta*. Spur short, deep violet.—G. C. BROWN. "Yes; *V. hirta* × *odorata* L. but the hybrids of these species are so variable that I hesitate to attach a name to any particular form."—P. M. HALL.

Viola segetalis Jord. f. *obtusifolia* (Jord.) Drabble; det. P. M. Hall. [" *V. agrestis* Jord."] (Ref. No. 2535.) 19, N. Essex; gravel pit, Dedham, June 11th, 1939. Very large plants, foliage pale green, petals very strongly tinged with blue.—G. C. BROWN.

Viola ruralis Bor.; det P. M. Hall. [" *V. agrestis* Jord. forma "?] (Ref. No. 2537.) 29, Cambs.; hedgebank, Linton, May 5th, 1939. Flower small, strongly tinged with blue. Not a typical *agrestis* in stipules but I do not think there is any hybridity.—G. C. BROWN.

Polygala calcarea F. Schultz. (Ref. No. 3734.) 7, N. Wilts.; Walker's Hill, June 14th, 1939.—J. D. GROSE. "Yes."—A. J. WILMOTT.

Geranium rotundifolium L. 41, Glamorgan; roadside, Grangetown, Cardiff, May, 1938.—Coll. A. E. WADE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Potentilla erecta (L.) Hampe × *reptans* L. (Ref. No. 4003.) 7, N. Wilts; Catcombe Wood, July 23rd, 1939. Stems rooting freely; flowers *ca.* 14 mm., petals 4-5; leaflets 3 and 5, small, broadly obovate, serrations acute, often below the middle; leaf-stalks medium; stipules ovate, usually entire, sometimes cleft.—J. D. GROSE. "This hybrid is notoriously difficult to distinguish from *P. procumbens* Sibth.; it is said to be sterile. I am at present making artificial crosses to produce the hybrid, in order to confirm its sterility and describe its characters. In the meantime, I see no reason for not calling these specimens *P. procumbens* Sibth., though the leaves, and the flowers especially, are rather small; it would have been useful to have had some detailed notes of the habitat of the plants, and, particularly, to have known whether the putative parents were present."—D. H. VALENTINE. [After seeing the above remarks Mr Grose reports that the gathering grew in a woodland clearing with *P. reptans* and *P. erecta* and he considers that no normal *P. procumbens* was present. Dr Valentine saw more material, sent him by Mr Grose, and still prefers to withhold a definite opinion. Mr

Pugsley in a letter to Mr Grose said he was inclined to agree to the names given by him to this plant and the following, remarking that the latter (4064) was a good deal like *P. procumbens* but that the short petioles of the stem leaves seemed to show influence of *P. erecta*. There appears to be an admirable opportunity for members to help if they would collect for distribution possible hybrids when the species are found growing together.—Ed.]

Potentilla erecta (L.) Hampe × *procumbens* Sibth. (Ref. No. 4064.) 7, N. Wilts.; Battle Lake Wood, Aug. 14th, 1939. Stems rooting frequently; flowers *ca.* 20 mm., petals 4; leaflets always 3, medium, narrowly obovate, serrations acute, usually not below the middle, base of the leaflet cuneate; leaf-stalks short; stipules ovate, usually entire, sometimes cleft below. This appears to be very near *P. procumbens*, but there appears to be good evidence of *P. erecta* (with which it grew), particularly in the short petioles.—J. D. Grose. "I think this is correctly determined, though whether the specimens represent the F_1 hybrid, or back crosses of this hybrid with one of the parents, it is difficult to say. Only breeding experiments can give us precise information."—D. H. Valentine.

Myriophyllum alterniflorum DC. (Ref. No. 36.) H. 16, West Galway; Renvyle, Connemara, Aug. 10th, 1939. Appears to be intermediate between the normal form and var. *americanum* Pugsley for which it was collected, but the leaf measurements exceed those given for the variety. —W. A. Sledge. "This is not the variety *americanum* Pugsley but a slender form of typical *M. alterniflorum* DC. The variety, which is a more dwarf plant with leaves only 3-5 mm. long, is confined in Ireland to the lakes of the limestone districts and does not occur in the acid waters of the west, where the typical form takes its place (*vide* Praeger in *Journ. Bot.*, *76*, 53, 1938)."—H. W. Pugsley. "In August, 1938, Mr J. P. M. Brenan and I, after seeing the variety *americanum* Pugsl. in Lough Beg, visited Loughs Shannagh and Kindrum in West Donegal, v.-c. H. 35. In the former was found an attenuate form of *M. alterniflorum* very similar to Dr Sledge's plant, and, in Lough Kindrum, plants we considered were identical with the variety. Mr Pugsley agrees with the above determinations, having seen the specimens and a table of measurements of the internodes, leaves and segments which I made from specimens from the three Loughs. Both the Donegal Loughs appear to occur in the granite area of the Fanad Peninsula."—N. D. Simpson.

Oenothera stricta Ledeb. ["*O. odorata* Jacq."] 6, N. Somerset; sand dunes, Burnham, July 20th, 1939.—Coll. A. E. Wade; comm. Dept. of Botany, National Museum of Wales. "A species with wiry stems, which has frequently gone under the name *O. odorata* Jacq., is *O. stricta* Ledeb. It has very narrow leaves, clasping bracts and slender fruits tapering downwards. The sepal tips are subterminal, 3 mm. long, the buds pubescent, red at least on the midribs, petals *ca.* 30 mm. long, yellow fading to terra-cotta. The home of this species is evidently S. America. *O. Agari* Gates, introduced into Australia, is closely related and perhaps conspecific. The measurements given are from my cultures of the Burnham plants."—Prof. R. RUGGLES GATES.

Galium Mollugo L. var. *genuinum* H. Br. 41, Glamorgan; roadside, Grangetown, Cardiff, May, 1938.—Coll. A. E. WADE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES. "Yes."—C. E. BRITTON.

Erigeron canadensis L. 41, Glamorgan; waste ground, Newport Road, Cardiff, Oct. 3rd, 1939.—Coll. A. E. WADE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES.

Filago apiculata G. E. Smith. (Ref. No. 4102.) 12, N. Hampshire; sandy field, Winchfield, Sept. 17th, 1939.—Coll. A. L. STILL; comm. E. C. WALLACE.

Doronicum Pardalianches L. 29, Cambs.; wood, Hildersham, May 29th, 1939.—G. C. BROWN.

Hieracium Peleterianum Mérat. 10. Wight; garden, Newport, July, 1939. This is named *H. Pilosella* var. *pilosissimum* Fries in the Isle of Wight list. As it flowers very sparingly in its Freshwater station—I have not seen it in flower there for some years—I removed a root to my garden, where it flowers freely.—J. W. LONG. "This is *H. Peleterianum* Mérat, somewhat abnormally luxuriant in growth and with poor flowers, as might be expected in a garden specimen. The wild plant would not show such long stolons."—H. W. PUGSLEY.

Hieracium tridentatum Fr. (Ref. No. 2359.) 19, N. Essex; Tiptree Heath, July 27th, 1939. Narrow leaved.—G. C. BROWN. "This is *H. tridentatum* Fr. *sensu lato*. I cannot name it more accurately at present."—H. W. PUGSLEY.

Hieracium maculatum Sw. ["*H.* sp."] (Ref. No. 3716.) 7, N. Wilts.; quarry, Kingsdown, Box. June 7th, 1939.—J. D. GROSE. "*Hieracium maculatum* Sw., collected rather early."—H. W. PUGSLEY.

Erica Mackayi Hook. (Ref. No. 34.) H. 16, West Galway; Craigga-More Lough, Roundstone, Connemara, Aug. 9th, 1939.—W. A. SLEDGE.

Primula elatior (L.) Schreb. × *vulgaris* Huds. (Ref. No. 2536.) 26, W. Suffolk; Spraggs Wood, Brent Eleigh, April 10th, 1939.—G. C. BROWN. "Yes."—R. MELVILLE.

Linaria repens (L.) Mill. × *vulgaris* Mill. 10, Wight; railway embankment, Cowes, Sept. 30th, 1939. A late flowering, but I have endeavoured to show at least one flower in each sheet.—J. W. LONG.

Euphrasia confusa Pugsley f. *albida* Pugsley. [" *E. nemorosa* (Pers.) Löhr."] 6, N. Somerset; pasture, Burnham, July 20th, 1939.—Coll. A. E. Wade; comm. Dept. of Botany, National Museum of Wales. " All *E. confusa* Pugsley f. *albida* Pugsley (luxuriant)."—H. W. Pugsley.

Melampyrum pratense L. var. *commutatum* (Tausch) Beck. (Ref. No. 4354.) 17, Surrey; in wood, Coulsdon, Aug. 19th, 1939. The form distributed is sub-var. *pseudo-nemorosum* Beauverd, marked by 2-3 pairs of intercalary leaves. It may be of interest to mention that the locality indicated is one given for *M. pratense* L. by De Crespigny in *A New London Flora*, 1877, p. 130.—C. E. Britton.

Utricularia vulgaris L. (Ref. No. 4023.) 17, Surrey; pool at the foot of Cooper's Hill, near Runnymede, July 26th, 1939. These specimens show the size which this species can attain: in some cases it will be seen that three sheets have been necessary to display one plant. Most of the specimens were sent to me fresh by Mr Wallace and dried by myself. These unfortunately were rather long in the post, with the result that the foliage deteriorated and they have not made such good specimens as they might have done. However, the fruiting habit is well shown.—P. M. Hall.

Mentha longifolia Huds. (Ref. No. 4290.) 16, W. Kent; near Keston, Sept. 2nd, 1937. Growing on edge of upland meadow. No habitation near at hand. Odour weak, recalling that of *M. viridis*.—C. E. Britton. " *M. longifolia* Huds. Among Sole's set of mints, recently unearthed at the Linnean Society's rooms, there is a sheet of a small Horse-Mint labelled *M. villosa tertia*, which is not referred to in Sole's book. It is very similar to this plant from Keston. One sheet of this set is much larger than the rest and the smallness of the plant may be due to the dry habitat. I should have liked to have seen how it behaved under cultivation."—A. L. Still.

Prunella laciniata L. 9, Dorset; pasture between Herston, Swanage, and the sea, July, 1939. The flowers were uniformly pale cream in colour, and I saw no other *Prunella* in the near neighbourhood. The plant could not, I think, have been a recent introduction.—J. W. Long.

Chenopodium album L. × *Berlandieri* Moq. ssp. *Zschackei* (Murr) Zobel. 10, Wight; garden, Newport, June and August, 1938, 1939. Raised from seed of a plant found by the Medina below Newport, in 1937, and named by Dr P. Aellen. The leaves of the mature plant are very variable. In the young plants, however, they seem very characteristic.—J. W. Long.

Polygonum Hydropiper L. 41, Glamorgan; ditches, Llanedyrne Road, near Cardiff, Oct. 5th, 1935.—Coll. A. E. Wade; comm. Dept. of Botany, National Museum of Wales.

Rumex conglomeratus Murray × *pulcher* L. (Ref. No. 4038.) 15, E. Kent; bank of canal south of Appledore, Aug. 19th, 1939.—E. C. WALLACE. " Agreed to by J. E. Lousley."—E. C. WALLACE *in litt.*

Rumex pulcher L. (Ref. No. 4041.) 15, E. Kent; bank of canal south of Appledore, Aug. 19th, 1939.—E. C. WALLACE. " Agreed to by J. E. Lousley."—E. C. WALLACE *in litt.*

" *Ulmus carpinifolia* Borckh." = *U. nitens* Moench. (Ref. No. 2540.) 19, N. Essex; edge of wood, Aldham, Sept. 24th, 1939. Leaves dark green and shining above, twigs very slender and pendulous. With exceptional long points to the leaves, actually longer than in any trees that I have examined before, and very deeply bi-serrate.—G. C. BROWN. " This is not typical of *U. carpinifolia* Gleditsch (the earliest authority for the name), which differs in leaf shape and has a smaller and sharper serrature. It is intermediate between *U. diversifolia* Melville and the tree known as *U. nitens* var. *Hunnybunii* Moss, and is probably a hybrid of this parentage. The leaf serrature is very similar in these elms. In the specimens, the leaf shape is intermediate or in individual leaves tends more towards one or other of the suggested parents, the lower surface is glandular, with very few simple hairs, except for the axillary tufts, as in the Hunnybun elm, but the petiole is pubescent as in *U. diversifolia*; short shoots with even-based leaves (a *U. diversifolia* character) are absent; the branchlets are stouter than in *U. diversifolia*, but are often more or less pubescent as in that species."—R. MELVILLE.

Betula alba L. 42, Brecon; Craig Cilau, near Crickhowel, July, 1937. —Coll. H. A. HYDE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES. " Yes."—E. F. WARBURG.

Salix triandra L. var. *amygdalina* (L.) Bab. forma *discolor*. (Ref. No. 2534.) 19, N. Essex; Middlewick Rifle Ranges, East Donyland, leaves Oct. 23rd, 1938; flowers April 23rd, 1939. The leaf shape in these mature leaves was very constant and the difference in colouration of the two surfaces striking. There are a number of small trees in this group and all material is of the same facies.—G. C. BROWN. " Yes, but the var. *amygdalina* is usually described as having the leaves ultimately glaucous beneath."—A. J. WILMOTT.

Salix Caprea L. × *viminalis* L. (Ref. No. 4103.) 17, Surrey; old brick-pits near Ewell, May 19th and Sept. 30th, 1939. I am not sure of the correct name of this plant as there are so many forms of the above hybrid.—E. C. WALLACE. " This is ×*S. Smithiana* Willd., but whether *S. Caprea* or *S. atrocinerea* is the Sallow parent is difficult to say. According to the criteria given by Linton (*Journ. Bot. Suppl.*, 1913, p. 32), it should be *S. atrocinerea*, for it has persistently pubescent twigs, narrow subentire stipules, slender catkins, and traces of striae on the wood under the peel. Further artificially made hybrid material is required for the elucidation of this series of Sallow-Osier crosses."—A. J. Wilmott.

Salix aurita L. ♀. (Ref. No. 3640.) 7, N. Wilts.; near Brinkworth, April 23rd and July 24th, 1939. Uncommon in N. Wilts.—J. D. Grose. "Yes."—A. J. Wilmott.

Salix arenaria L. [" *S. arenaria* × *repens* L."] ♀. (Ref. No. 3643.) 7, N. Wilts.; Lydiard Plain, April 23rd and July 24th, 1939.—J. D. Grose. "I do not see why this is not '*S. arenaria*,' i.e. *S. argentea* Sm."—A. J. Wilmott. "This silky-leaved plant is, I think, the form usually described as *S. arenaria* L. or *S. argentea* Sm. Fraser (*B.E.C. 1932 Rep.*, 370 (1933)) gives the conclusions of Dr Floderus on the distinguishing floral characters of *S. arenaria* and *S. repens.* Here it is stated that *S. arenaria* has sessile stigmas and pubescent ovaries, while *S. repens* possesses styles and has glabrous ovaries. The plants now distributed have long styles and pubescent ovaries, and apparently Dr Floderus and Fraser prefer such plants to the hybrid, *S. arenaria* × *repens.* Fraser states that plants with glabrous ovaries are rare, and it seems also that forms without styles are uncommon. Hence the combination of distinct styles and pubescent ovaries occurs in most of the British material. Are the views of Dr Floderus on this point now countenanced in this country?"—J. D. Grose.

Salix arenaria L. ["*S.* (*arenaria* ×) *repens* L."] ♂. (Ref. No. 3642.) 7, N. Wilts.; Lydiard Plain, April 23rd and July 24th, 1939. The situation for this plant is an isolated one, there being no other known within over twenty miles. Individuals vary much in leaf-breadth.—J. D. Grose.

Vallisneria spiralis L. (Ref. No. 31.) 63, S.W. Yorks.; canal, Salterhebble, Halifax, May 13th, 1939. The part of the canal in which this grows receives hot water discharged from a neighbouring cotton mill. The locality has long been known to local botanists as a habitat for *Potamogeton epihydrus* var. *ramosus* (*P. pennsylvanicus*), yet the *Vallisneria* was unknown until four years ago. It is now very plentiful and flowers twice each year, in May and September.—W. A. Sledge.

Hydrilla verticillata (L. fil.) Presl. (Ref. No. 35.) H. 16, West Galway; Renvyle, Connemara, Aug. 10, 1939. One of the most abundant aquatics of the lake. Other species occurring with it include *Callitriche autumnalis*, *Potamogeton Berchtoldii*, *Naias flexilis*, *Nitella translucens*, *N. batrachosperma*, *Chara aspera*, and *C. fragilis*. This shallow lake differs from all the other Connemara lakes I have visited in having a richly silted bottom, which accounts for the luxuriant carpet of submerged vegetation which everywhere covers it. The plankton flora is also markedly different from that of other Connemara lakes.—W. A. Sledge.

Luzula Forsteri (Sm.) DC. (Ref. No. 3705.) 8, S. Wilts.; Collingbourne Wood, May 31st, 1939.—J. D. GROSE.

×*Potamogeton undulatus* Wolfg., *P. crispus* L. × *praelongus* Wulfen. ["×*P. venustus* Baagöe, *P. alpinus* Balb. × *crispus* L., a small floating piece so determined in 1939."] (Ref. No. 39.1157.) H.39, Antrim; shallow water, junction of a channel and Six Mile Water, Antrim, Aug. 16th, 1939. Seen in the same waters, August 1938, by J. P. M. Brenan and N. D. Simpson.—Coll. J. P. M. B. and N. D. S.; comm. N. D. SIMPSON. "A most interesting plant. The floating fragments collected in the same locality in 1938 were erroneously referred by us to ×*P. venustus* Baagöe ex A. Benn.; *cf. Journ. Bot.*, 77, 254. The splendid material collected in 1939 has made clear the true identity of the plant as *P. crispus* × *praelongus*. Material of ×*P. undulatus* was collected also by C. H. Waddell from the River Lagan near Molly Wards, Belfast, Antrim, in May 1906; this is apparently the first record for the British Isles. All records of ×*P. undulatus* hitherto published for the British Isles are errors based on specimens of ×*P. Cooperi*, *P. perfoliatus* and *P. praelongus*. It is worthy of note that in the Six Mile Water ×*P. undulatus* grows with ×*P. Cooperi*, which is the plant formerly recorded from that river as ×*P. undulatus*—an interesting coincidence."—J. E. DANDY and G. TAYLOR.

×*Potamogeton fluitans* Roth, *P. lucens* L. × *natans* L.; det. J. E. Dandy and G. Taylor. (Ref. No. 3680.) 11, S. Hants.; Moors River at Palmers Ford, Aug. 20th, 1939.—P. M. HALL. [See *Journ. Bot.*, 77, 255.—ED.]

Potamogeton acutifolius Link. (Ref. No. 4032.) 14, E. Sussex; dyke on Pevensey Level near Rickney, July 30th, 1939. Generally distributed all over the Levels.—E. C. WALLACE. "Yes."—J. E. DANDY and G. TAYLOR.

Carex lepidocarpa Tausch. ["*C. Oederi* Retz. var. *elatior* Anderss."] (Ref. No. 32.) 65, N.W. Yorks.; shores of Semmerwater, July 2nd, 1939. —W. A. SLEDGE. "Two things that strike one about this plant at first glance are (a) its apparent sterility and (b) its resemblance to *C. lepidocarpa* Tausch. A closer examination confirms these impressions and suggests that the plant may be a hybrid between *C. lepidocarpa* and one of the several forms of what has hitherto been known as *C. Oederi* Retz. (see *Journ. Bot.*, 77, 301-304). It has the tall habit, peduncled male spike, and reflexed fruits of *C. lepidocarpa*, but differs from this species mainly by its smaller spikes and much smaller fruits with rather shorter beak, all rather pointing to the influence of '*C. Oederi*,' but exhibiting no really definite character of this latter species. Dr Sledge, the collector of the plant, points out a difficulty in accepting it as a hybrid. He says that if the '*C. Oederi*' of British botanists is there at all it must be extremely scarce, as he made a close examination of the sedges present and failed to find it. It has not been recorded for v.-c. 65. Dr Sledge goes on to say that the plant under discussion is growing side by side with what I have determined as *C. lepidocarpa*, for half-a-mile along the Semmerwater shore, distinct from each other and each in itself apparently without variation. As Dr Sledge says, most hybrids occur in small quantity ' amongst abundance of the parents.' Further, ' if this plant is a hybrid its abundance and uniformity would suggest that it is a fixed hybrid of the *Spartina Townsendii* type.' An alternative suggestion of mine, with which Dr Sledge is more inclined to agree, is that his plant is a sterile form of *C. lepidocarpa*. A combined genetical and taxonomic investigation into the very puzzling *Carex flava* groups is now being conducted by a friend and myself, and will, it is hoped, lead to satisfactory results. The various forms and hybrids which appear to link up the so-called species in this group have proved most difficult to identify with any degree of assurance."—E. Nelmes. " I now agree with Mr Nelmes that the plants are sterile *C. lepidocarpa* Tausch. I must reject the suggestion that hybridity with *C. Oederi* auct. is involved, on the grounds (a) of the abundance and uniformity of the plant distributed and (b) of the absence of *C. Oederi* (which I am satisfied I did not overlook) throughout the entire Pennine chain in Yorkshire. A temporary seasonal sterility due possibly to abnormal climatic conditions would also account for the remarkable fact that no reference to this plant, which is so strikingly distinct in its small utricles from the associated *C. lepidocarpa*, is made by Baker, Lees or any other of the numerous Yorkshire botanists who have visited the Lake."—W. A. Sledge.

Carex limosa L. (Ref. No. 4104.) 108, W. Sutherland; swamp near Badcall, Scourie, July 5th, 1939.—Coll. P. M. Hall and E. C. Wallace; comm. E. C. Wallace.

Carex Hudsonii Ar. Benn. (Ref. No. 3356.) 12, N. Hants.; marsh on the left bank of River Itchen, about half a mile west of Easton, June 11th, 1939.—P. M. Hall.

×*Carex axillaris* Good. (Ref. No. 4079.) 17, Surrey; ditch in lane to Newdigate, Dawes Green, Aug. 26th, 1939. Frequent on the weald clay of this part of Surrey.—E. C. Wallace. " Notes on this hybrid in *B.E.C. 1933 Rep.*, 777 (1934), apply also to this gathering."—E. Nelmes.

Carex vulpina L. (Ref. No. 4066.) 13, W. Sussex; by dyke on the Wild Brooks, Amberley, June 25th, 1939. This is the plant referred to by E. Nelmes in " Notes on British Carices IV," *Journ. Bot.*, 77, 260.—E. C. Wallace. " Yes. Since the publication, in the *Journal of Botany*, of the paper referred to by Mr Wallace, I have received a letter from the Dutch botanist Kern in which he mentions that he thinks that he has found a distinguishing character between *C. vulpina* and *C. nemorosa* which he would like other botanists to test. He finds that the lowest sheaths of *C. nemorosa* are light brown and do not, or scarcely, split up into fibres; *C. vulpina* has dark brown or nearly black sheaths which break up into hair-like fibres, so that its culms are surrounded at the base with the dark remains of the old sheaths. He notes that there is the same difference between *C. paniculata* and *C. paradoxa*. In his opinion, even young plants can be distinguished by this character. Mr Wallace's specimens do not exhibit the basal parts sufficiently well to show the character mentioned, as he wisely refrained from digging up specimens of this rare British sedge. In future we must carefully examine the basal sheaths of *C. Otrubae* Podp. in plants at various stages of development, and also of *C. vulpina* L., if it can be done without completely destroying individual plants."—E. NELMES.

Carex diandra Schrank. (Ref. No. 33.) 61, E. Yorks.; Kelleythorpe Marsh, Driffield, July 8th, 1939. Bracketed as extinct or dubious for v.-c. 61 in the *Comital Flora*, presumably on account of the entry in Robinson's *Flora of East Yorks.*, but it has been known to Yorkshire botanists in this station for nearly forty years.—W. A. SLEDGE.

Setaria italica (L.) Beauv. 41, Glamorgan; waste ground, Newport Road, Cardiff, October 3rd, 1939.—Coll. A. E. WADE; comm. DEPT. OF BOTANY, NATIONAL MUSEUM OF WALES. "Yes."—C. E. HUBBARD.

Mibora minima (L.) Desv. (Ref. No. 3339.) 9, Dorset; naturalised in Stewart's Nursery, Ferndown, April 23rd, 1939. Members may like to see these specimens to compare the habit of the species in cultivated ground compared with that in its natural habitats.—P. M. HALL.

Polypogon monspeliensis (L.) Desf.; det C. E. Hubbard. ["*P. maritimus* Willd."] (Ref. No. 2264.) 19, N. Essex; malting refuse, Hythe Quay, Colchester, June 17th, 1923. Not seen since 1926.—G. C. BROWN.

Calamagrostis epigeios (L.) Roth. (Ref. No. 4048.) 13, W. Sussex; damp field near Partridge Green in the Adur Valley, July 23rd, 1939.—E. C. WALLACE. "Yes."—C. E. HUBBARD.

Deschampsia setacea (Huds.) Hack. (Ref. No. 3672.) 9, Dorset; Verwood Lower Common, July 30th, 1939.—P. M. HALL. "Yes."—C. E. HUBBARD.

Brachypodium pinnatum (L.) Beauv. × *sylvaticum* (Huds.) Beauv. (Ref. No. 39.1135.) H. 39, Antrim; between wood and pasture, south of Garron Tower, Aug. 14th, 1939. Both the parent species were present. See Praeger, *Irish Naturalist's Journal*, 6, 160.—Coll. J. P. M. BRENAN and N. D. SIMPSON; comm. N.D.S. "? *Brachypodium pinnatum* (L.) Beauv. × *B. sylvaticum* (Huds.) Beauv."—C. E. HUBBARD. "Mr Hubbard in a letter to me gives some interesting notes which he allows me to record here. He says that the specimens distributed appear to be intermediate in several respects but it would be necessary to make a study of the variations of the two species shown throughout their area of distribution before making an exact determination. A supposed hybrid between *B. pinnatum* and *B. sylvaticum* was recorded by S. Andersen from Denmark (*Bot. Tidsskr.*, *41*, 429, 1931). Another putative hybrid between *B. pinnatum* and *B. sylvaticum* var. *villosum* Lej. & Court. was described by Mdlle. A. Camus and named ×*B. Cugnacii* (*Bull. Soc. Bot. France*, *78*, 100, 1931). It was collected at Verrières in France. The description shows that it must differ in a number of characters from my plant. In his study of the genus Saint-Yves referred both hybrids, with a query, to *B. pinnatum* var. *glaucovirens* (Murb.) Saint-Yves (*B. sylvaticum* subsp. *glaucovirens* Murb.). Murbeck's plant came from Herzegovina and was found growing with *B. sylvaticum*. Saint-Yves (*Candollea*, *5*, 435, 446, 1934) does not consider it to be a hybrid, but he did not see either Andersen's or Cugnac's specimens."—N. D. SIMPSON.

Equisetum variegatum Schleich. ? var. *majus* Syme. 92, S. Aberdeen; Braemar, July 16th, 1939.—Coll. R. MACKECHNIE; comm. E. C. WALLACE. "*E. variegatum* Schleich.: this is somewhat intermediate between the typical and varietal states, but the variety appears to be only an ecological state, not worth distinguishing."—A. H. G. ALSTON.

Mr E. Nelmes has re-examined (see p. 202) those *Carex* specimens of the 1938 Distribution which were in the herbarium of the late Editor. The determinations of *C. lepidocarpa* Tausch, *C. Hudsonii* Ar. Benn., and *C. Otrubae* Podp. were confirmed, but unfortunately there was no specimen of the *C. Hostiana* × *lepidocarpa* among Mr Hall's plants. The only note received for publication is:

Carex leporina L. var. *longibracteata* Peterm. 17, Surrey; Peasemarsh, July 23rd, 1938.—E. C. WALLACE. "I have always considered this distinct plant, apparently constant in its variation from the species, to be deserving of varietal rank. Probably, also, it is not identical with Petermann's var. *longibracteata*, but, like Mr Lousley, I have seen neither the original description of this nor an authentic specimen, and until one can do so the matter must remain *sub judice*. In my view *C. leporina* var. *malvernensis* is a superfluous name for *C. ovalis* var. *bracteata*: my reasons for this view are set out in detail in one of my 'Notes on British Carices' to be published shortly."—E. NELMES.

Mr C. E. Hubbard has kindly sent the following notes on some of the grasses contributed to the 1938 Distribution. The specimens were from the parcel sent to the late Hon. Editor; four of the gatherings had been omitted from the Report—see pages 204, 205.

Panicum sanguinale L. 11, S. Hants.; Southampton, Sept. 1937.—J. W. Long. "*Digitaria sanguinalis* (L.) Scop."—C.E.H.

Phleum phleoides (L.) Karst. 26, W. Suffolk; Thetford, June 15th, 1920.—Coll. M. Cobbe; comm. F. Rilstone. "Correct. Two forms are present, one with ciliate-keeled, the other with glabrous-keeled, glumes."—C.E.H.

Ammophila baltica (Fluegge) Link. 68, Cheviotland; Ross Links, Sept. 1938.—Coll. H. Fisher; comm. Nottingham Natural History Museum. "Corrrect."—C.E.H.

Corynephorus canescens (L.) Beauv. 27, E. Norfolk; Caister-on-Sea, July 31st, 1920.—Coll. M. Cobbe; comm. F. Rilstone. "Correct."—C.E.H.

Festuca elatior L. × *Lolium multiflorum* Lam. (Ref. No. 3854.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple. "Probably correct, but the resulting hybrids usually have ciliolate auricles."—C.E.H.

Festuca elatior L. × *Lolium perenne* L. (Ref. No. 3855.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple. "Probably correct, but the resulting hybrids usually have ciliolate auricles. I have seen good material of the hybrid from Jack Daw Lane in which the cilia are present."—C.E.H.

Bromus Thominii Hard., *B. hordeaceus* var. *Thominii* Aschers. et Graebn.; det. C.E.H. ["*Bromus commutatus* Schrad."] (Ref. No. 3857.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple.

Bromus lepidus Holmb.; det. C.E.H. ["*Bromus* ——."] 10, Wight; Newport, June 1932.—J. W. Long.

Bromus lepidus Holmberg f. *lasiolepis* Holmberg. (Ref. No. 3856.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 24th, 1938.—J. F. G. Chapple. "Correct."—C.E.H.

Lolium perenne L. var. *cristatum* Pers. 7, N. Wilts.; Walcot, Swindon, June 13th and July 1st, 1938; spikes broad, flattened, coiled and drooping when young, afterwards ± erect but remaining broad, probably similar to the form distributed in 1924, see *B.E.C. 1924 Rep.*, 746 (1925).—J. D. Grose. "A plant of this form cultivated at Kew reverted to the normal condition."—C.E.H.

?*Lolium multiflorum* Lam. × *perenne* L. (Ref. No. 3858.) 23, Oxon.; waste ground, Jack Daw Lane, Oxford, June 28th, 1938.—J. F. G. Chapple. "Yes, the material seen appears to be the product of hybridisation between these species."—C.E.H.

BRIT. MUS.
(N.H.)
[illegible] DEC [illegible]
BOTANY

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The British Batrachia. Pearsall (1928)	2	6
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Distribution of Pansies in England and Wales. Drabble (193[illegible])	1	6
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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

VOL. XII. PART V.

REPORT FOR 1941-42

(WITH BALANCE SHEET FOR 1942)

BY

THE HONORARY EDITORS,

E. C. WALLACE,

2 Strathearn Rd., Sutton, Surrey;

A. J. WILMOTT,

Natural History Museum, Cromwell Road, London, S.W.7.

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MATERIAL FOR THE NEXT REPORT.

Material for the next Report—Records, Notes, etc. —should be sent to Mr A. J. Wilmott, as Mr E. C. Wallace is now with H.M. Forces (R.A.F.).

SPECIMENS FOR IDENTIFICATION.

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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. XII. PART V).

Victoria Regina.

Floreat flora.

REPORT FOR 1941-42

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A. J. WILMOTT,
Natural History Museum, Cromwell Road, - London, S.W.7.

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THE
BOTANICAL SOCIETY & EXCHANGE CLUB OF THE BRITISH ISLES.

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*Elected March 1942.

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Swedish Academy of Sciences, Dr Arne Holmberg, Chief Librarian, Stockholm 50, Sweden.
University of California, Berkeley, California, U.S.A.
Vermeulen, P., Woodenstraat 14III, Amsterdam-Zuid, Holland.

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†Drabble, Mrs E., Tregudda, Ayr, St Ives, Cornwall.
Lumb, D., 1 Market Place, Dalton-in-Furness.
Sherrin, W. R., A.L.S., South London Botanical Institute, 323 Norwood Road, S.E.24.
Swanton, E. W., M.B.E., A.L.S., Educational Museum, Haslemere, Surrey.

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L Adair, G. S., M.A., F.R.S., Low Temperature Station, Downing Street, Cambridge.

Adams, Rev. J. H., M.A., Landulph Rectory, Saltash, Cornwall.
Adams, L. T., 96 Burnam Road, Shirley, Warwickshire.
Adamson, Prof. R. S., M.A., Dept. of Botany, University of Cape Town, S. Africa.
Adeane, Hon. Mrs H., West Hall, Mundford, Thetford, Norfolk.
†Airy-Shaw, H. K., B.A., F.L.S., Daglingworth Rectory, Cirencester, Glos.
†Alston, A. H. G., M.A., F.L.S., Dept. of Botany, British Museum (Nat. History), Cromwell Road, S.W.7.
Amherst, C. T., Luttrell Arms Hotel, Dunster, near Minehead, Somerset.
*†Ash, G. M., Lower Birtley Farm, Witley, Surrey.

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Bloomer, H. H., Longdown, Sunnydale Road, Swanage, Dorset.
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Bradshaw, David B., 38 Morehampton Road, Dublin, Eire.
*Braid, Major K. W., West Garth, 27 Craigmillar Ave., Milngavie, Glasgow.
†Brenan, J. P. M., 9 Longwall Street, Oxford.
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Brighton Public Library, Church Street, Brighton 1.
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Brokenshire, Fred. A., 2 Rock Avenue, Barnstaple, Devon.
Brooklyn Botanic Gardens, 1000 Washington Ave., Brooklyn 25, N.Y., U.S.A.
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Brown, John, 16 Stafford Road, Sheffield 2.
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Bunker, Herbert E., 27 Broad Oak Lane, Penwortham, Preston, Lancs.
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†Burges, Dr R. C. L., 133 Soho Hill, Birmingham.
†Butcher, R. W., B.Sc., Ph.D., F.L.S., Culford House, Ewe Lamb Lane, Bramcote, Notts.

L Cadbury, Miss Dorothy A., 40 Edgbaston Park Road, Birmingham 15.
Cambridge, The Botany School, The University.
†Campbell, Miss M. S., 83 Chatsworth Court, London, W.8.
Cardew, Major J. W., 44 Putnoe Lane, Bedford.
Cator, Miss Diana, St Anne's, Happisburgh, near Norwich, Norfolk.
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†Chase, Capt. C. D., Campbell College, Portrush, Co. Antrim, N.I.
Chesher, W., M.A., 51 Queen's Drive, Mossley Hill, Liverpool 18.
Clark, Dr William A., Dept. of Botany, King's College, Newcastle-upon-Tyne 2.

Cobbe, Miss A. B., Lingworth, Sea Road, Felpham, Bognor Regis.
Cooke, R. B., Kilbryde, Corbridge, Northumberland.
Cornell, New York State College of Agriculture, Cornell Univ., Ithaca, N.Y., U.S.A.
*Corstorphine, Mrs Margaret, Hillside House, Arbroath, Angus.
Cory, Miss A. M., Fullerton Manor, Andover, Hants.
Creed, Dr R. S., M.A., New College, Oxford.
Crerar Library, John, 86 East Randolph Street, Chicago, Ill., U.S.A.
Crisp, Wm. C., Schoolhouse, Stewkley, Leighton Buzzard, Beds.
Cross, Edward R., 12 Filey Road, Scarborough.
Cross, Hon. Marjorie, Ash House, Broughton-in-Furness.
†Cruttwell, Rev. N. E. G., The Rectory, Basingstoke, Hants.

Daly, Mrs Bowes, Drumlanrig Castle, Thornhill, Dumfries-shire.
Dandy, J. E., M.A., F.L.S., British Museum (Natural History), The Zoological Museum, Tring, Herts.
Darlington and Teesdale Naturalists' Field Club, J. B. Nicholson, Secretary, 16 Welbeck Ave., Darlington.
David, Miss Aileen M., Hillside, Llandaff, Cardiff.
†Davie, Dr J. H., Clifton College at Westcliff, Bude, Cornwall.
Davy, Lady, Green End, Keyhaven, Lymington, Hants.
Day, Miss E., 32a St Peter Street, Sandwich, Kent.
†Day, Francis M., The Downs School, Colwall, Malvern.
Dent, G., Speedwell, Wych Cross, Forest Row, Sussex.
Dent, Mrs R. W., O.B.E., Flass, Maulds Meaburn, Penrith.
Devonshire, The Duke of, Chatsworth, Buxton, Derbyshire.
Dony, John G., B.Sc., Ph.D., 41 Somerset Ave., Luton, Beds.
Ducie, Rt. Hon. The Earl of, c/o The Tortworth Estate Office, Falfield, Glos.
Dufferin, Brenda, Marchioness of, Sheldon Manor, Chippenham, Wilts.
†Duncan, Miss Ursula, Parkhill, Arbroath, Angus.
*Dunston, Capt. Ambrose E. A., Burltons, Donhead St Mary, Wilts. (via Shaftesbury, Dorset).
Durham University, (Miss K. M. Chalklin, M.Sc.) Dept. of Botany, University Science Laboratories, South Road, Durham.

*†Edees, E. S., M.A., 19 Dartmouth Avenue, Westlands, Newcastle, Staffs.
Eire, National Museum, The Acting Director, Kildare Street, Dublin, Eire.
Eire, Controller, Stationery Office (Publications Branch), Dublin.
Eliot, Lady Alethea, Newtimber Place, Hassocks, Sussex.
Ellis, A. E., M.A., F.L.S., Epsom College, Surrey.
Ellis, E. A., Castle Museum, Norwich.
Ellis, Edgar W., Gedham, Ossett, Yorks.
†Evetts, Mrs E. F., J.P., Wood House, Tackley, Oxon.
Eyre, Mrs R. S. K., Woodside, Crowborough, Sussex.

Fanshawe, D. B., Mazaruni Station, British Guiana.
Findeisen, K. D., Yonder Fowdon, Churston Ferrers, South Devon.
*Fleming, Dr G. W. T. H., F.L.S., Barnwood House, Gloucester.
Foggitt, Mrs G., 22 Haslemere Road, Sketty, Swansea.
†Frankland, J. N., 59 Otley Road, Skipton, Yorks.

German, Mrs P., Newlands, The Plantation, Durrington, Worthing, Sussex.
Gilmour, J. S. L., M.A., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Gladstone, Viscountess, 27 Chester Terrace, S.W.1.
Glyn, Hon. Mrs Maurice, 28 Albert Hall Mansions, S.W.7.
Godalming Nat. History, Footpath and Rambling Society, (Hon. Sec.) E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.
Goddard, H. J., The Knap, Skew Bridge, Wilton Road, Salisbury, Wilts.
L Gordon, Seton, C.B.E., Upper Duntuilm, Isle of Skye.
Gough, Mrs H., Raford, Athenry, Co. Galway, Eire.

†Gough, J. W., M.A., 43 Sandfield Road, Headington, Oxford.
Graham, Mrs E., 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Rex, 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Prof. R. J. D., M.A., D.Sc., F.R.S.E., Dept. of Botany, The University, St Andrews.
†Graveson, A. W., M.A., Tintagel, Stoke Road, Beaminster, Dorset.
Gray, Henry, Yewtree, West Malling, Kent.
Gray Herbarium, The, Harvard University, Cambridge, Mass, U.S.A.
Green, T. H., Sabinal, Weston, Bath.
Gregor, Rev. A. G., M.A., B.D., Firle Vicarage, near Lewes, Sussex.
*†Grose, J. D., 18 Regent Street, Swindon, Wilts.
Gurney, John, Walsingham Abbey, Norfolk.

Haines, John W., Midhurst, Green Lane, Hucclecote, Gloucester.
Haines, Mrs J. W., Midhurst, Green Lane, Hucclecote, Gloucester.
Hall, Fredk. T., 2 Hartington Terrace, West Road, Buxton, Derbyshire.
Hall, R. H., 2 Hartington Terrace, West Road, Buxton, Derbyshire.
Hall, Miss Margaret, The Gables, Weobley, Hereford.
Hardaker, W. H., 451 City Road, Edgbaston, Birmingham 17.
Hardinge, Hon. Lady, St James's Palace, London, S.W.1.
Hare, Dr C. Leighton, The Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey.
Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., King's College, Newcastle-upon-Tyne.
Hartley, J. W., Irene, Marple Road, Stockport.
Harvey, Rev. H. H., Clawton Vicarage, Holsworthy, Devon.
†Hassall, Mrs B., The Manor House, Wheatley, Oxford.
Haughton, Dr J. W., Tawnachie, Wood Lane, Falmouth.
Haynes, Gerald, 8 Canterbury Road, Oxford.
*Hayward, Miss Ida M., F.L.S., 7 Abbotsford Road, Galashiels, Selkirkshire.
Heron, Miss May, Erclands, Ercall Lane, Wellington, Salop.
Hichens, Mrs, c/o Mrs Hingston, Windward House, Tavistock, Devon.
Hill, S. Ashton, Carnaby, 19 Jordan Road, Four Oaks, Warwickshire.
Horticultural Society, The Royal, Vincent Square, Westminster, S.W.1.
*Howarth, W. O., D.Sc., F.L.S., Botany Dept., The University, Manchester 13.
Hull, University College, The Librarian, Hull.
Hurst, C. P., F.L.S., Landulph Rectory, Saltash, Cornwall.
Hutchinson, R. R., 11 Fryston Avenue, Croydon, Surrey.

Jack, James, Luggiebank, Cumbernauld Station, Glasgow.
†Jackson, A. Bruce, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
Jekyll, Francis, Munstead Wood, Heath Lane, Godalming, Surrey.
Jowett, Miss Edith B., Oreton Mount, Grange-over-Sands, Lancs.

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Kirby, Mrs G. E., Sankey House, Brook, near Ashford, Kent.
Knight, H. H., M.A., The Lodge, All Saints Villas Road, Cheltenham.

*Last, G. V. C., F.L.S., M.R.C.S., L.R.C.P., 22 Rutland Ave., Sefton Park, Liverpool.
Lawn, Dr J. G., 6 Lothbury, London, E.C.2.
Leadbitter, E. C. E., C.V.O., 160 Addiscombe Road, Croydon.
Leake, Miss P., 17 Westmorland Road, Bromley, Kent.
Leather, Miss Vivien M., Wyards, Studland, near Swanage, Dorset.
Lee, John R., 96 Finlay Drive, Dennistoun, Glasgow, E.1.
Legard, Lady Edith, Maes Court, Tenbury, Worcester.
Leicester Museum and Art Gallery, Leicester.
L Lewis, J. Spedan, Leckford Abbas, Stockbridge, Hants.
†Lewis, R., "Fidler's Elbow," Staunton Road, Monmouth.

Libbey, R. J., Springway, Reffley Lane, Wootton Road, King's Lynn.
Linnean Society of London, The, Burlington House, Picadilly, W.1.
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London Natural History Society (Botanical Section), G. R. A. Short (Secretary), 36 Parkside Drive, Edgware. Middlesex.
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Long, Jas. W., Hillside, St John's Road, Newport, Isle of Wight.
L Longfield, Miss C. E., 20 Pont Street, London, S.W.1.
†Lousley, J. E., 7 Penistone Road, Streatham Common, S.W.16.
Lucas, Baroness, 22 Sussex Square, Hyde Park, W.2.

L†McClintock, Major D., Park Grove, Withyham, Tunbridge Wells, Sussex.
McGill, J. F., Ardantrae, 5a Racecourse Road, Ayr.
†Mackechnie, Robert, B.Sc., 9 Skirving Street, Shawlands, Glasgow, S.1.
Mackenzie, Major Roderick, Fawley Court, Henley-on-Thames.
McLean, Prof. R. C., University College, Newport Road, Cardiff.
MacLeay, Kenneth N. G., Botany Dept., St Andrews University.
McLeod, Sir Murdoch, Bart., Culverlea House, Pennington, Lymington, Hants.
Makins, F. K., F.L.S., Great Down Cottage, Bruton, Somerset.
Manchester Museum, The, The University, Manchester 13
Marks, C. E., Islington Cemetery, East Finchley, N.2.
Marsden-Jones, E., F.L.S., Close Cottage, Littleton Panell, Devizes, Wilts.
Marsh, Miss F. H. B., J.P., F.L.S., Thornleigh, Mordiford, Hereford.
Martin, Rev. W. Keble, M.A., F.L.S., The Vicarage, Torrington, Devon.
Matthews, Prof. J. R., Botany Department, The University, Old Aberdeen.
Melville, R., B.Sc., Ph.D., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Mills, J. N., 47 Banbury Road, Oxford.
Mills, Dr W. H., 23 Storey's Way, Cambridge.
Milne, James Fairweather, M.A., M.B., Ch.B., Rocksley House, Boddam, Peterhead, Aberdeenshire.
Milne-Redhead, E., M.A., F.L.S., Green Leaze, Cirencester. Glos
Milvain, Mrs M., Green Close, Snowshill, near Broadway, Worcs.
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Morley, Earl of, Saltram, Plympton, Plymouth, Devon.
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†Nelmes, E., Daglingworth Rectory, Cirencester, Glos.
Nelson, George A., Ph.C., F.L.S., 37 The Crescent, Adel, Leeds 6.
New York Botanical Garden (W. J. Robbins, Director), Bronx Park, New York, N.Y., U.S.A.
Northamptonshire Natural History Society, c/o H. G. Allen, B.Sc. (Hon. Sec., Bot. Sec.), Ivydale, Wootton, Northampton.
Norton, F., " Westward Ho," 3 Pencisely Rise, Cardiff.
*Nottingham Public Natural History Museum, Wollaton Hall, Nottingham.

Oslo, The Botanical Museum of the University of, c/o Royal Norwegian Ministry of Education, Kingston House, Princes Gate, London, S.W.7.
Oxford University, Dept. of Botany, The Librarian, Oxford.
Oxford University, Dept. of Forestry, The Librarian, Oxford.

Palmer, The Hon. W. J. L., The Old House, Wonston, Sutton Scotney, Hants.
Parkin, J., M.A., F.L.S., Blaithwaite, Wigton, Cumberland.
Patton, Dr Donald, M.A., B.Sc., Ph.D., F.R.S.E., 15 Jordanhill Drive, Glasgow, W.3.
Penson, J. H., 11 Well Walk, Hampstead, N.W.3.
Phelps, Mrs J. V., Woodbury, East Avenue, Bournemouth, Hants.
†Phillips, Edwin Masson, 26 Cheltenham Place, Plymouth, Devon.
Pickard, Miss Kathleen, Harveys, Glynde, Lewes, Sussex.
Pope, C. N., 256 Hythe Road, Ashford, Kent.

Pownall, Rev. G. C., Glenroy, Windmill Road, Minchinhampton, Glos.
Price, W. R., Cockleford Mill, Cowley, near Cheltenham.
Priestley, Prof. J. H., B.Sc., D.S.O., Dept. of Botany, The University, Leeds.
Prime, C. T., M.A., F.L.S., 147 Upper Selsdon Road, Croydon, Surrey.
†Pugsley, H. W., B.A., 81 Alexandra Road, Wimbledon, S.W.19.

Ramsbottom, J., O.B.E., M.A., Dr.Sc., P.P.L.S., Keeper, Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
Raven, John E., The Oxford House, Mape Street, Bethnal Green, London, E.2.
Rawlins, Miss E., Stokestown House, New Ross, Co. Wexford.
Rea. Carleton, B.C.L., M.A., 6 Barbourne Terrace, Worcester.
Rees, Mrs F. L., 5 Hill Park, Tenby, Pembrokeshire.
Rees, John, B.A., M.Sc. (Adviser in Agricultural Botany), University College (S.W. & M.), Cathays Park, Cardiff.
L Richards, Mrs H. M., Caerynwch, Dolgelley, N. Wales.
Richards, Dr P. W., The Botany School, Cambridge.
Ridley, H. N., C.M.G., F.R.S., 7 Cumberland Road, Kew Gardens, Surrey.
Ridley, Hon. Mrs J., Mockbeggars Hall, Claydon, Suffolk.
*Rilstone, F., A.L.S., Lambourne Hill, Penhallow, Truro, Cornwall.
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Roberts, G. A., 53 Broadway, Fulford, Yorks.
Roche, The Lady, Cadlington, Oxford.
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Russell, Lady Victoria, The Ridgeway, Shere, Guildford, Surrey.

Salisbury, Prof. E. J., C.B.E., D.Sc., F.R.S., F.L.S., Willow Pool, 4 Gills Hill Lane, Radlett, Herts.
Salmon, Miss Hilda M., Harwood, Horsham, Sussex.
†Sandwith, Mrs Cecil, 26 Canynge Square, Clifton, Bristol, 8.
†Sandwith, N. Y., M.A., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
Saunders, Miss E. F., Ortler, Bouncers Lane, Prestbury, Cheltenham, Glos.
Severn, Lady, Winterbrook Lodge, Wallingford, Berks.
Seward, Mrs O. G., Weston House, near Petersfield, Hants.
Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex.
†Simpson, N. Douglas, M.A., F.L.S., F.R.M.S., Maesbury, 3 Cavendish Road, Bournemouth, Hants.
Skene, Prof. Macgregor, D.Sc., University, Bristol, 8.
*†Sledge, Dr W. A., 9 St Chad's Drive, Headingley, Leeds, 6.
Small, Prof. J., D.Sc., Dept. of Botany, Queen's University, Belfast, N.I.
Smith, Dr H. B. Willoughby, M.B., F.R.C.S., St Clements, 9 Carson Road, Gainsborough, Lincs.
Smith, R. L., 24 Grand Avenue, Ely, Cardiff, Glam.
Smith, Prof. Sir Wm. Wright, D.Sc., Royal Botanic Garden, Edinburgh, 4.
L Southall, A. W., Clifford's Mesne, Newent, Glos.
South London Botanical Institute, 323 Norwood Road, London, S.E.24.
†Sowter, F. A., Ashtead, 9 North Avenue, Leicester.
Stationery Office, H.M., Princes Street, Westminster, S.W.1.
Stephenson, Rev. Dr T., D.D., Irfon, Aberystwyth.
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Stewart-Sandoman, Mrs, Achnashellach, Ross-shire.
†Still, A. L., B.A., Long Hayne, Cove, Tiverton, Devon.
Stuart, Mrs C. U., 120 London Road, Worcester.
Stuart-Edwards, J. J., Imperial Hotel .Exmouth, S. Devon.
Swaine, Miss A. K., Pisang Cottage, Nailsea, Somerset.
Swann, Eric L., 282 Wootton Road, King's Lynn.

L Taylor, Dr G., British Museum (Natural History), Cromwell Road, London, S.W.7.

Taylor, Miss M., 6 Kent Gardens, Ealing, W.13.
Taylor, S. A., 34 Nelson Street, Leicester.
Temperley, Geo. W., Restharrow, Apperley Road, Stocksfield, Northumberland.
Templeman, A., Geological Museum, Exhibition Road, South Kensington, S.W.7.
Thomas, Charles, Arden, 48 Manor Road North, Edgbaston, Birmingham 16.
†Thomas, Miss E. Mary, Moorfield, Nottage, Porthcawl, Glam.
Thorold, C. A., Hele, Bradninch, Devon.
Tindall, Mrs K. B., West Downs, Winchester, Hants.
Todd, Miss E. S., Aldbourne, Marlborough, Wilts.
Toke, Chas. Hugh, The Haven, Green Lane, Crowborough, Sussex.
Townsend, C. C., 68 Gloucester Road, Cheltenham, Glos.
Travis, W. G., 9 Barton Road, Liverpool 9.
Trethewy, A. W., Artillery Mansions, Victoria Street, S.W.1.
Tristram, Mrs R. M., F.L.S., Revillo, Ash Bank, Stoke-on-Trent, Staffs.
Tunbridge Wells Municipal Museum, 6 Upper Grosvenor Road, Tunbridge Wells, Kent.
Turnbull, Miss E., Stone Lodge, Vines Lane, Hildenborough, Kent.
Turner, A., 140 Pine Street, Nelson, Lancs.
Turrill, W. B., D.Sc., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

Ullman, Lt.-Col. R. B., Trove, New Road, Esher, Surrey.

†Vachell, Miss Eleanor, F.L.S., Fairfield, Ely Road, Llandaff, Cardiff.
Valentine, D. H., M.A., Ph.D., Botany School, Cambridge.
Verdcourt, B., 86 Claremont Road, Luton, Beds.
Victoria, The Public Library of, Melbourne, c/o Henry Sotheran Ltd., 2 Sackville Street, Piccadilly, W.1.
†Vivian, Miss C., 37 Wilton Crescent, London, S.W.1.

†Wade, A. E., F.L.S., Dept. of Botany, National Museum of Wales, Cardiff.
Waldy, Hon. Mrs H. P., Sonamerg, Higher Sea Lane, Charmouth, Dorset.
*†Wales, National Museum of, Dept. of Botany (Keeper, H. A. Hyde, M.A.), Cardiff.
*†Wallace, E. C., 2 Strathearn Road, Sutton, Surrey.
†Wallis, J. R., Timberlog, Parsonage Lane, Lamberhurst, Kent.
Warner, S. Allen, M.P.S., Whitelea, Broadway, Didcot, Berks.
L Warren, W. E., Selborne, Horsell Rise, Horsell, Woking, Surrey.
Washington, U.S. Dept. of Agriculture, The Librarian, Washington, D.C., U.S.A.
Watchorn, Dr Elsie, 25 Luard Road, Cambridge.
Watson, Wm., 245 Southlands Road, Bickley, Bromley, Kent.
Watts, Lt.-Col. G. A. R., Highbury, Victoria Road, Fleet, Hants.
Webster, Subaltern M. McCallum, A.T.S., c/o Bank of Scotland, Macduff.
L Wedgwood, Mrs, 2 Hatherley Road, Kew Gardens, Surrey.
Wedgwood Herbarium, The, Marlborough College, Wilts.
†Welch, Mrs B., B.Sc., 49 Lichfield Court, Richmond, Surrey.
Wells, Mrs E. M., 91 Colum Road, Cardiff.
†West, C., "The Cowl House," Holt Wood, Aylesford, Kent.
Weyer, Major B. G. Van de, South Marston Manor, Swindon, Wilts.
Weyer, Major William Van de, Clyffe, Dorchester, Dorset.
†Whellan, J. A., Lieut., 42 Stamford Street, Liverpool 7.
Whiting, Miss M. M., Rosemary Cottage, Blythburgh, Suffolk.
Whyte, James S., 31 Hayswell Road, Arbroath, Angus.
Wilkinson, J. S., 26 Golder's Rise, Hendon, N.W.14.
Willan, Mrs Hugh, Bridges, Teffont, Salisbury.
Williams, Mrs F. R., 234 Highland Avenue, Winchester, Mass., U.S.A.
Williams, J. E., 28 Spencer Road, St Marks, Cheltenham.
Williams, I. A., West Hall, Kew Gardens, Surrey.

Williams, M. L., Layton Villa, Linden Road, Bognor, Sussex.
†Wilmott, A. J., M.A., F.L.S., F.R.G.S., Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
Wilson, Albert, F.L.S., Tir-y-Coed, Ro Wen, near Conway.
Winter, W. P., B.Sc., F.G.S., 6 Grange Avenue, Saltaire, Yorks.
†Wolley-Dod, Lt.-Col. A. H., Berkeley Cottage, Mayfield, Sussex.
Woodhead, J. E., B.Sc., F.I.C., Ph.C., 325 Kennington Road, London, S.E.11.
L Wright, Dr F. R. Elliston, Braunton, N. Devon.

Yeoman, Miss Ruth, The Green, Brompton, Northallerton, Yorks.
York Public Library, City of, York.
Young, Rev. Andrew, Stonegate, Tunbridge Wells, Kent.
L Young, Miss Gertrude A., 5 Woodlands Terrace, Glasgow, C.3.
Yuill, Edward, Norwood, Towthorpe Lane, Haxby, York.

ORDINARY MEMBERS ABROAD.

(The following are still regarded as members although the difficulty or impossibility of communicating with them under present conditions has prevented confirmation. Those members living overseas who have been able to return the Reconstruction Form are included in alphabetical order in the main list.)

Arsene, Bro. Louis, Maison St Joseph, Highlands, Jersey.
Genève, Switzerland, Le Directeur du Conservatoire et du Jardin botanique de la Ville de.
Holland, J. S. (Westwell Manor, Burford, Oxon.), New Modderfontein Staff Mess, P.O. Van Ryn Benein, S. Africa.
Lindquist, Dr B., Skogshogskolan Experimentalfaltet, Stockholm, Sweden.
McCrea, Mrs M. A., 4 Springfield Terrace, King's Road, Guernsey.
Nannfeldt, Dr John Axel, Botaniska Institutionen, Uppsala, Sweden.
Pharmacie, Bibliotheque de la Faculté de, 4 Avenue de la Observatoire, Paris, France.

SUMMARY OF THE ABOVE MEMBERSHIP LIST.

Non-Subscribing Members.		
Honorary Members	19	
Corresponding Members ...	4	
		— 23
Subscribing Members.		
Ordinary Members	296	
Life Ordinary Members ...	13	
Exchange Members	19	
		— 328
Total Membership ...		351

ACCOUNTS FOR THE YEAR 1942.

GENERAL FUND.

To Balance from 1941	£475 1 10	By Printing Reports		£180 19 6
,, Part Interest on Post Office Savings Bank Deposit for 1941	1 9 9	,, Printing (other than Report) and Stationery ...		8 17 4
,, Subscriptions Received in 1942	55 9 0	,, Cost of circulating members who failed to return Reconstruction Form ...		1 4 5
,, Subscriptions Paid to late Treasurer in 1941 and since claimed	6 0 0	,, Fire Insurance on books at Yardley Lodge		0 6 0
,, Sale of Reports and Reprints	18 4 11	,, Honorarium to Caretaker at Yardley Lodge ...		1 11 6
,, Balance of Suspense Fund	24 11 0	,, Postages and Petty Expenses:—		
		Treasurer ...	£4 17 8	
		Acting Secretary	5 10 0	
		Caretaker at Yardley Lodge	1 10 0	
				11 17 8
		,, Balance		376 0 1
	£580 16 6			£580 16 6

SUSPENSE FUND.

To Balance from 1941	£30 11 0	By Subscriptions claimed by Members as paid to late Treasurer in 1941	£6 0 0
		,, Balance of unclaimed subscriptions, transferred to General Fund	24 11 0
	£30 11 0		£30 11 0

PUBLICATIONS FUND.

To Balance from 1941	£155 19 9	By Binding 50 Copies each of Comital Flora and British Plant List	£11 8 0
,, Sales of Fl. Bucks, paid to us in error	4 1 0	,, Refund to Messrs T. Buncle & Co. Ltd. of amount paid in error ...	4 1 0
,, Sales of Fl. Northants ...	0 17 11	,, Balance	164 14 6
, Sales of Comital Flora and British Plant List ...	19 4 10		
	£180 3 6		£180 3 6

LIFE MEMBERS' FUND.

To Balance from 1941	£145 16 0	By Balance	£149 8 11
,, Part Interest on Post Office Savings Bank Deposit, 1941	3 12 11		
	£149 8 11		£149 8 11

MISS TROWER'S FUND.

To Balance from 1941	£16 7 11	By Balance	£16 7 11
	£16 7 11		£16 7 11

BENEVOLENT FUND.

To Balance from 1941	£41 3 6	By Balance	£41 3 6
	£41 3 6		£41 3 6

BALANCE SHEET AT 31ST DECEMBER 1942.

General Fund	£376 0 1	500 National Savings Certificates, at cost	£400 0 0
Publications Fund	164 14 6	Cash at Bank	120 4 3
Life Members' Fund	149 8 11	Deposit at Post Office Savings Bank	227 10 8
Miss Trower's Fund	16 7 11		
Benevolent Fund	41 3 6		
	£747 14 11		£747 14 11

(Signed) J. E. LOUSLEY,
Hon. Treasurer.

Examined and found correct.
February 21st, 1943.

(Signed) H. W. PUGSLEY,
Hon. Auditor.

SUMMARY OF PROCEEDINGS OF MEETINGS (OCTOBER 1942—MARCH 1943).

A meeting of the Committee was held on October 28th, 1942, in the rooms of the Linnean Society of London, the Chairman and three other members being present. It was agreed that Mr J. E. Lousley should take the vacancy on the Editorial Sub-Committee caused by the death of Mr Corstorphine. The Sub-Committee appointed to report on the Society's property made its report, details of which are printed later in this volume. The consideration of the revision of its insurance was referred to the Editorial Sub-Committee, of which the Treasurer had now become a member. It was agreed that the same Sub-Committee should decide questions concerning the prices of the Society's publications, and also concerning any reductions to be made to members. An Honorarium was granted to Mr Whiting, caretaker at Yardley Lodge, Oxford, for his assistance in attending to orders received for the Society's publications.

A meeting of the Committee was held on Friday, March 26th, 1943, in the same rooms, the Chairman and eight other members being present. The actions taken at the previous meeting, at which a quorum was not present, were confirmed. A letter from Dr G. Taylor was considered, in which he reported the purchase from Messrs Blackwell (Dulau), of Oxford, of a book inscribed as having been presented to the Society, purchased by Messrs Blackwell as part of Dr G. C. Druce's library. As the book also bore Dr Druce's bookplate (see our Report for 1925, plate with pp. 935-8), the Committee decided that the firm should be asked to examine any other books from the same source still in their possession, to see if any of them were the property of the Society. The Treasurer reported that the present membership (344) would not, at the rate of subscription of ten shillings per annum, suffice to finance the normal peace-time activities of the Society. It was agreed that the subscription should return to the normal ten shillings per annum as from January 1st, 1944. Mr H. W. Pugsley was re-elected Hon. Auditor. Decisions of the Editorial Sub-Committee regarding the prices of reprints from Reports and of parts of Reports were accepted. It was agreed that the five best sets of the Reports should be reserved for sale to libraries (after a set had been set aside as the Society's own set), and that the remaining sets should be available to individuals asking for them. It was also agreed that the average reduction of 25% allowed to members purchasing whole volumes of Reports should also be allowed on the purchase of single parts of Reports, but only on a purchase for personal use. use.

At the Annual General Meeting which followed, presided over by the Chairman, the Rt. Hon. H. T. Baker, the recommendations and decisions of the Committee were approved. The Reports of the Acting Secretary, Treasurer, and Joint Editors were adopted. After presenting the latter, Mr Wallace reported that the publication of the 1939-1940 Report had given considerable satisfaction. The Chairman's expression of the thanks of the Society to the Linnean Society of London for their generous loan of their rooms for our meetings was received with acclamation.

REPORT BY THE HON. ACTING SECRETARY

(to the Annual General Meeting, 1943).

The death, on the day of our last Annual General Meeting, of Mr R. H. Corstorphine, has already been recorded in the Report recently published; it is a grievous and irreplaceable loss. The firm of Messrs Bunclo will, however, still produce our publications, and it is hoped that a Report for 1941-42 will be brought out this year. A considerable number of Plant Records have been sent in, mainly by members working in their home areas, now that travel has become so difficult and even undesirable. The publication of the 1939-40 Report has stimulated the sale of "separates" of papers from our past Reports, and the arrangements which have been made to supply these from the stock at Oxford are working fairly satisfactorily, but members are requested to make allowance for the existing difficulties if they meet with a little delay. Although our property at 9 Crick Road has been put into a general order, the time available when I did this was too short to do the work thoroughly, and search is sometimes necessary by the caretaker, to whom we are indebted for sending off the orders. Let us hope that when we meet next year we shall be able to envisage the end of the present makeshifts. A. J. WILMOTT.

HONORARY TREASURER'S REPORT ON FINANCE AND MEMBERSHIP, 1942.

During 1942 the Society has made considerable progress towards overtaking the arrears in our work caused by the period of enforced inactivity. The hard work done by Messrs Wallace and Wilmott has resulted in the publication of the Distributor's Reports for 1938 and 1939 and the Editor's Report for 1939-40, and their cost has been the principal charge to the accounts for 1942.

The income for the year, though small, has been greater than was anticipated. In 1941 most members paid their subscriptions at the old rate before they heard of the decision to make a temporary reduction to five shillings, and hence they had a balance to their credit sufficient to pay their subscriptions for the following year. The amount of £55 9s 0d which was received in respect of subscriptions during 1942 was therefore much larger than expected, and consisted mainly of the subscriptions of members who continued to pay at the old rate. Many of these members had deliberately and generously continued to pay the higher subscription, and although a total of £51 9s 3d stood to the credit of member's account as "Subscriptions paid in advance" on December 31st, 1942, it is likely that the greater part of this sum represents gifts to the Society by members who have not clearly stated their wishes.

The Suspense Fund, which was opened to clear up receipts and payments of the late Treasurer of which no records existed, has now been wound up. The balance of £24 11s 0d transferred to the General Fund represents payments made to Mr Druce by members who have since died or who failed to return properly completed Reconstruction Forms.

A welcome sequel to resumed activity has been the receipts from sales of Reports and Reprints and of the books published by the Society. These receipts have been larger than in an average pre-war year, and the opportunity of obtaining the publications again has been greatly appreciated.

It will be seen that we still remain liable to members for the Reports for 1941 and 1942, payment for the printing of which will considerably reduce the Society's assets. The next Annual General Meeting may therefore consider it advisable to revert to the former subscription of 10s 0d per annum in 1944. In the meanwhile we are most grateful to those members who have continued to pay at this rate. Mr H. W. Pugsley has again acted as Hon. Auditor, and I should like to express my personal thanks to him for his help in these difficult times.

Owing to the work of reconstruction, the last statement of membership was dated April 22nd, 1942, and this Report therefore only covers a period of just over eight months. Since April we have gained four new members—Mrs F. M. Barton, Dr P. W. Richards, Dr J. H. Davie, and Mr R. Lewis. Miss B. Hurst has resigned, and we are extremely sorry to record the loss through death of Messrs C. B. Tahourdin, A. H. Evans, and G. T. Fraser. With these four additions, and three losses, our membership now stands at 343.

December 31st, 1942. J. E. Lousley, Hon. Treasurer.

HONORARY JOINT EDITORS' REPORT.

The appearance of the 1939-40 Report appears to have given considerable satisfaction and pleasure. Although Mr Wallace has now joined the Royal Air Force, he is still in England and will be able to assist in the production of the 1941-42 Report, which is now in course of preparation. Although the material available is, naturally, reduced in quantity, it is hoped that an interesting Report can be prepared, and the reduction in size will accord with the present need for economy in the use of paper. It is hoped that members who are able to continue with some botanical work will, since so many are now unable to do any, bear in mind the need of material for a 1943, or perhaps 1943-44, Report, and send material for Plant Records, Plant Notes, papers, and Abstracts from Literature. Will those who can make contributions please pay attention to the paragraphs at the beginning of some of these sections, since by following the requests there made they will save the Editors a vast amount of transcription in the preparation of the copy for the printer.

A supply of sheets of the *Comital Flora* and *British Plant List* has been reported by the printers to be available, and the binding of a number for immediate use has prevented these works from going out of print for the time being, which is specially fortunate as work on new editions cannot be seriously undertaken at present. The increased costs of binding and paper have necessitated the rise in prices shown on the cover. Preparatory work on new and revised editions of the Society's publications will be resumed as soon as practicable.

E. C. WALLACE.
A. J. WILMOTT.

REPORT ON THE SOCIETY'S PROPERTY.

Following the offer by Mr E. G. Baker to bequeath to the Society a portrait of his father, the Committee appointed a small Sub-Committee to report on the property of the Society. Their report shows that most of their property is still housed at Yardley Lodge, Oxford, where, in addition to Mr Chapple's correspondence and an annotated copy of the *British Plant List*, ed. 2, also a box of Dr Druce's B.E.C. correspondence (for 1905 and 1906), there are:—

1. A stock of past Reports, only two complete sets but some nearly complete.
2. A stock of reprints from these Reports.
3. Stocks of the *British Plant List*, ed. 2, and *Comital Flora.*
4. A stock of the *Flora of Northamptonshire.*
5. A ledger containing a cut copy of Watson's *Topographical Botany*, ed. 2, annotated by Dr Druce, evidently the foundation of the *Comital Flora.*
6. A cupboard full of MS. and proof of some published Reports, etc.

Some further stock in sheet form of both the *British Plant List* and *Comital Flora* is with Messrs Buncle & Co. Ltd., the amount available being unknown.

Mr Hall's bequest of his annotated copies of *British Plant List* and *Comital Flora* were defined as being " the property of the Society in the custody of the Editor for the time being."

After considering the treatment of specimens sent in for identification, the Committee decided that " the main requirement is that specimens recorded in Reports should be preserved somewhere, preferably in National Collections, and that the location of such specimens should be shown in the Society's Index of Records."

The Committee decided that one complete set of Reports and two copies—so far as available—of the reprints, should be set aside as the Society's copies, and this has been done.

OBITUARIES.

Thomas Bates Blow, who died at Welwyn, his birthplace, in January 1941, must have been a familiar figure to more than one generation of botanists. The two groups that attracted him most were ferns and charophytes, his collecting of the former being mainly in the homeland and of the latter in foreign countries.

His interest in ferns had started, so he once told me, by the time he was thirteen and it lasted all his life. A friend of his, Mr Greenfield, has kindly contributed the following note:—" A large part of Mr Blow's garden at Welwyn was given up to the cultivation of British hardy ferns, among which were examples of the choicest varieties acquired from the best sources. Mr Blow himself raised a large number of plants from spores and also by apospory; and during his long membership of the British Pteridological Society, of which he was a Vice-President, he did a considerable amount of hunting of wild ferns and found several varieties, including a fine crested form of *Blechnum Spicant.* His garden collection of varieties of *Polystichum angulare* and *P. aculeatum* was specially notable." In this garden, with its greenhouse containing examples grown from Japanese fernballs, Blow took a great pride.

In 1874 he made the acquaintance, which proved a lifelong friendship, of Henry and James Groves. They found him already a most ardent field botanist and his enthusiasm led them to study many critical plants of which previously they had fought shy. When a few years later the Groves brothers took up the study of charophytes Blow's help eventually proved of immense value, James Groves stating of him in 1927 that " his experience as a hunter of these plants far away exceeded that of any other man." An outline of his charophyte tours is to be found in the *Journal of Botany* for October 1938.

Whatever Blow did he did heartily. An inherited love of bee-keeping led to his making many visits abroad with the aim of improving the British breed and, shrewd man of business that he was, he had by the age of forty-two made enough out of his factory for modern apiary appliances to admit of his indulging in his fondness for travel. Amongst the countries he visited were the West Indies, British Guiana (where he had an exciting time of it in rushing torrents studying the life history of the *Podostemaceae*), Ceylon, New Zealand, Australia, Japan and the borders of the Mediterranean, the unfrequented paths appealing to him most: and on these travels he never missed an opportunity of collecting charophytes.

His most famous trip was to Madagascar in 1924, where for one thing he was determined to investigate the alleged larvicidal properties of charophytes in relation to mosquitoes. He was satisfied that there was nothing in the theory and, moreover, made a fine collection of these plants there, one of them, *Nitella Blowiana,* being named by Groves in his honour.

Y. MUS.

R. H. Corstorphine

His specimens were all properly mounted by floating them out and latterly, on Groves's advice, he started preserving also some suitable fruiting portions in fluid, a practice that alone admits of the satisfactory determination of delicate specimens.

Blow had various other interests. He was an expert photographer and a great collector of prints and other works of art in Japan, where he lived off and on for fifteen years.

During the last war he drove ambulances for the French Red Cross and was made a Chevalier of the Legion of Honour.

Blow's life was full of adventure and he thoroughly enjoyed it all. Even after he had passed eighty he still maintained much of his youthful energy. His kindly, cheerful disposition brought him a vast circle of friends, many of very old standing.

A fine account of this remarkable man's eventful career by Mr Reginald Hine appeared in the *Hertfordshire Express* of January 25, 1941.

G. O. Allen.

Blow was by so far the oldest member of this Society that his name can be first found in the membership list printed in the Report for 1872 (as J. B. Blow, corrected in the next Report). He sent *Centaurea aspera* for distribution in 1876, from Guernsey and Jersey. One of the almost forgotten records made by him is *Filago gallica* from Hertfordshire, a specimen of which is in the Natural History Museum among the vouchers of the Botanical Record Club, of which he was Curator and Treasurer for many years.

A. J. Wilmott.

Robert Henry Corstorphine, who died on March 25th, 1942, after a short illness, was born on November 13th, 1874. He was the son of Henry Corstorphine, English master at Arbroath High School, and at that school he received his early education. Proceeding to St Andrews University he did brilliantly in taking his B.Sc. in Chemistry, Botany, and Zoology, obtaining a distinction in the last-named. From the University he went to the West of Scotland Technical College, Glasgow, where he taught Chemistry and carried out investigations with G. G. Henderson on the Benzyl Group, the results being published in the *Transactions of the Chemical Society* (1901: "Condensation of Benzyl with Dibenzile Ketone"). He later moved to Dundee, still teaching Chemistry, but it was not long before he returned to Arbroath to join the publishing firm of T. Buncle & Co. (later Ltd.), of which he was Managing Director for nearly 40 years, dying only just before the celebration of the centenary of *The Arbroath Guide*, which had for so long been his life's work. The high standards which he set and his great attention to detail, coupled with his training in Botany and Zoology, resulted in the publication by the firm of several biological periodicals, and of various County Floras. In the production of illustrations he set a very high standard: the plate of my *Orchis hebridensis* was better than the original photographic print which I sent him!

His interest in Botany, which started in the course of his University career, developed into his chief hobby. The existing Flora of his county —that published by Gardiner in 1848—was so much out of date that Corstorphine set out to publish an up-to-date one to supersede it, and in this he was assisted by his wife. In the course of the work to this end he explored all parts of Angus, but especially the Clova area, where later he had a residence. His knowledge of the flora brought him into contact with most of the British botanists, to whom Clova is, at some period of their lives, a lodestone. All who thus got to know him will remember, with a keen sense of loss, the delightful hospitality which they received from him and Mrs Corstorphine, his vivid sense not only of humour but also of fun, his companionship and guidance in the field, and his cheery help in whatever problem happened at the moment to be in the foreground. He was a good judge of character, and until he knew his man he sometimes developed a " blind eye " for some rarity being sought, for he had an extraordinary love of country, and took what might be called a " fatherly " interest in the safety and good health of its floral treasures. As a former teacher, he also had a dislike for " spoon-feeding," and preferred to let his visitor discover the plant for himself where possible, during the course of which he gained, I think, considerable insight into the character of his companion. He particularly deplored the destruction of the native flora by over-collecting, and I remember his discourse on the condition of Clova in respect of *Hieracia* before its spoliation by the " Hieraciarchs " of the previous generation. I have myself had the privilege of seeing one part of our mountains which these collectors never visited, and the abundance of the alpine hawkweeds in that place was such that I then felt able to understand Corstorphine's remarks about Clova " before and after." Corstorphine would sometimes point the lesson as some visitor was lunching with him at the top of Jock's Road, with the remark that " this (few square yards of green in front of him) was where Gardiner formerly got the *Juncus castaneus* which he distributed in such quantity," or words to that effect. It certainly is far too little realised how easy in some localities it is to exterminate a rarity—one by one, even—and all botanists should be alive to the danger of indiscriminate collecting.

As he worked at the Flora of Angus, Corstorphine amassed a fine herbarium of the county, the specimens in which were generally sent for revision by experts on the various groups. The Flora MS. is, unfortunately unfinished, and Dr Taylor has undertaken to finish, revise, and have it published. The herbarium of Angus plants, when this has been done, will go to Dundee University. His life was so full that he had but limited leisure, though even so he sometimes would take a day off to help some searcher who was failing in his quest for some special plant. Apart from botanical work such leisure as he found was spent in an occasional day's angling, or a game of golf, at which in his youth he showed some proficiency. On rocks he was a good climber until a serious accident forced him to go more gently. He was one of the few original members of the Arbroath Special Constabulary, in which he enrolled in 1914 before volunteering for service in France as a transport driver, 1914-1918.

In addition to his membership of our Society he was a Fellow of the Linnean Society of London and of the Botanical Society of Edinburgh. He was also a member of the Moss Exchange Club, and with Mrs Corstorphine made many records for the bryophyte list of Angus. His death is a great loss to our own Society, for his technical knowledge and experience were of great help to us in the production of our Reports, as these had been in Dr Druce's day, both in the Reports and publication of County Floras. He was one of those who cannot be replaced, and who will be greatly missed.

A. J. Wilmott.

R. H. Corstorphine will be very sadly missed, not only for his great genius for hospitality equally shared with Mrs Corstorphine, but for his wisdom and guidance both in the open and literary fields, his very high standards achieved in the scientific publications through impeccable attention to detail, his clarity of vision which enabled him to reach quickly to the core of a problem or difficulty, his ability to judge character which made him distinguish instantly the despoiler from the trustworthy botanist, his sense of humour and youthful sense of fun, and above all, his kindness and unfailing readiness to help all who sought his counsel.

M. S. Campbell.

Francis Druce, born on January 3rd, 1873, was killed on the night of 16th-17th April 1940, by an enemy bomb which burst outside his shelter after passing through his flat. The ensuing fire almost completely destroyed his collection and library, except for a number of valuable books, mostly herbals, which had been removed for safer storage, and are now mainly divided between the Linnean Society of London, who receive the fine copy of the Grete Herball, and Mr I. A. Williams. The fine collection of County Floras and related works was completely lost.

That such a peace-loving man should meet such a violent end seems particularly incongruous. He was of a more than usually retiring and reserved nature, avoiding crowds and preferring the company of one or two on his botanical expeditions, during which he had visited most areas of the British Isles and had seen *in situ* nearly as many of our native plants as his better-known namesake, Dr G. C. Druce.

Educated at Harrow and Oxford, he entered the old-established solicitor's firm of Druces & Attlee. Poor health brought about a partial retirement in 1910, but he did not completely retire until 1923. By temperament and training he made the ideal Treasurer for Scientific Societies, and in this capacity served the Royal Meteorological Society from 1913 to 1918 and again from 1925 to 1932. He was Treasurer of the Linnean Society from 1931 to the autumn of 1940, when he became Master of the Innholders' Company, of which when younger, in continuance of family tradition, he had been clerk. Of our own Society he became Treasurer when Sir Roger Curtis left this country, and during his Treasurership he did much to put and keep our finances on a sound basis. His legally trained mind was also most helpful on our Rules Sub-Committee when the existing Rules were drafted. At the time of his death he was Acting Secretary during Mr Chapple's absence on military duty.'

Meteorology was an early but life-long interest to him. He formed a considerable library on the subject, which he presented to the Royal Meteorological Society about 1934, but he continued, even when travelling, his regular observations on temperature, winds, thunderstorms and clouds. His chief hobby, however, became the collecting of flowering plants and botanical books. The latter was the subject of an article in the Private Libraries series in the *Times Literary Supplement* (31st *October* 1938). His herbarium, of which but a few sheets remain, was composed almost entirely of plants collected by himself, mainly British.

Since 1919 I have explored with him most parts of the British Isles. He was a man of regular and conventional habits, which somewhat restricted the exploration of some of the more out-of-the-way hills, for he preferred to start after breakfast and return for tea. But he went extraordinarily well on the hills, especially on rock, going easily in places where with my unsound knee I could not attempt to follow. He seemed absolutely devoid of fear. If he thought he could obtain a specimen on difficult rock he just went and got it—if he thought it unsafe to try, which was rare, he just left it. To see him leaning over the edge of the summit of Ben Nevis to examine the precipices below, and calling to me over his shoulder that they were the finest precipices he had seen in the country, made me shiver, but I came to learn that he was quite safe, wherever he chose to go. Although a disciplinarian, impatient—sometimes even intolerent—of weakness, he was so considerate of my weak joint that I was never made to feel that its handicap was a nuisance to him—" We won't go up there, I don't think you would like it," or some such remark after he had made a reconnaissance, and the place was left.

He was an excellent organiser, running his expeditions to schedule, and he was Spartan in his determination to carry out programmes, regardless of anything but the very worst weather. Possibly his meteorological knowledge prevented him from making many mistakes, and I soon learnt that if he carried a macintosh I had better do so, and if he didn't, I need not, whatever the weather looked like. I once sweltered with one under a blazing sun, but never again. I remember starting off in heavy Irish mist to ascend Brandon Mountain from the east. What the summit would be like I feared to imagine, and as the ascent must be made by a single path which was unknown to us, I felt supremely unhappy when, after less than a mile, the water began to run down my spine, and was most relieved when Druce turned to me and said placidly, " Well, I think this is utterly ridiculous." But that was the only time I remember turning back, though I have vivid memories of standing eating a soaking lunch in torrential rain in Corrie Kander and on Lochnagar, and of hunting *Luzula arcuata* on the Ben More Assynt massif till we were unable to see for the rain which poured over our eye-balls every time we bent down to look at anything. It was this determination, coupled with efficiency and disregard of personal discomfort that made him a force to be reckoned with when anything had to be done.

He often seemed unable to go gently. I remember leaving London with him overnight in a heat wave and arriving for late breakfast at the Lawers Inn. It had been a tiring journey: we would have a quiet day and a stroll round. We had better take some lunch so that we should not feel tied. The result was that soon after midday we were overlooking Glen Lyon and picking the *Carex atrofusca* and *Carex microglochin* we had come to Lawers to see, in such biting cold wind from the Ben that my fingers were completely numbed white. "Rest" days were a little apt to be of this sort, a stroll becoming a hard day. But after dinner we would often stroll to some woodland haunt of birds and lie resting listening to their evensong. Or we would watch some glorious sunset, such as one from the end of the Torridon road over the Western Isles, a riot of colour never to be forgotten. At such times his rather restless soul seemed fully at peace.

Only once do I remember him excited, and the cause was—a rainbow! Rainbows, even fine double ones such as this was, are among the things that one takes for granted as being fixed and uniform. When, therefore, one sees a perpendicular rainbow shaft ascending like a pillar outside each rainbow arc and joining it where it disappears into the sea, one may well stare at it in wonder. We were returning to Flodigarry from the Cuillins, and Druce, noticing it first, cried out—"Oh! I say! Stop! Stop!!" And indeed it was a remarkable sight, astounding and unbelievable. The explanation was, however, simple, the pillars being parts of additional rainbow arcs formed by the reflection of the sun in the glassy waters of the sea behind us. It took the Outer Hebrides to break quite through his iron personality. As we landed at very low tide at Rodel from North Uist, on seaweed-covered and very slippery rock some distance below the jetty, and staggered along with our luggage, in imminent danger of going into the sea at any moment, his remark "I feel somehow as if nothing really matters" showed that even he was not impervious to the quality of life in the Outer Isles.

His love of Nature was very deep and intense. Wild Roses were probably his favourite flower, and they never failed to arouse his admiration. During our first visit to Thirsk the lanes were a riot of colour and it was easy to understand why Mr J. G. Baker took such an interest in them. Druce developed a really good eye for, and knowledge of, our native plants. At first it was generally I who found the rarity we were hunting, but in later years we divided the honours. On our journeys together we discovered *Myosotis sicula* in Jersey, rediscovered the supposedly extinct *Spiranthes gemmipara* in its original Cork station, and discovered two Orchids new to Science—*Orchis Francis-Drucei* and *O. kerryensis*. *Myosotis brevifolia* we discovered in Teesdale, but when on my return I showed it to Salmon as a new species, he told me that he was already describing it himself (though he did not do so until he had obtained better material the following year). Apart from the numerous successful hunts we had together, Druce made great numbers of trips to various places, and the revision of his collection, had it survived, might well have produced much further of botanical interest. He made no study of any critical genus, although he often collected material for study, and he preferred that others should write up the results of his collecting. Only just before his death did he, with Mr Sandwith, publish in the *Journal of Botany* (1941, p. 86) an account of a rare Abyssinian crucifer—*Brassica integrifolia* var. *carinata*—which he had found on soil thrown over a shelter in Chelsea.

He gave his services freely and generously to causes which interested him, and among those who missed him greatly were they with whom he worked in connexion with his parish church, and particularly the boys' club, which was one of his great interests in life. His friends were glad that he did not live crippled to know the havoc wrought among his treasures.

A. J. WILMOTT.

GORDON TRAVERS FRASER was born at Tralee, Co. Kerry, on 28th August 1882, and died on 1st August 1942, after an illness of nearly three months. He was educated at Charterhouse and Trinity College, Cambridge, where he gained a B.A. degree, and rowed in the 1st Trinity Boat in the Bumping Races, winning his oar in 1902 and 1903. After coming down from Cambridge, he took up Civil Engineering and for some years he was on survey work in Ireland with his father. He was then engaged in the construction of London Tubes, and from 1908 to 1910 in South America on building the Transandine Railway in the Argentine and Chile. During the first world war from 1914 to 1918 he was working for the Government constructing a camp at Chiseldon, Wilts, and the Ordnance Depot at Didcot. Later on he took a Commission in the R.E. and was in charge of work at the Chepstow shipyards. When the war was over, he was engaged in building a railway for the Shale Oil Works in Norfolk and for the R.A.F. Camp at Halton, Bucks. Then for a few years he took up poultry farming, and when he finally retired he came to live in S. Devon in 1934.

Soon after his arrival he joined the Torquay Natural History Society, and quickly made his presence felt among local botanists. He was elected hon. secretary of the Botanical Section in 1935, two years later a member of the Committee, and Hon. Librarian in 1941, a post which he held until his death. His work in connection with the Society cannot be separated from what he did for the *Flora of Devon* and the Devonshire Association. On joining this Association in 1935, he immediately began to take an active interest in the preparation of the Flora, so that in 1936, when Rev. W. Keble Martin was made Editor, Fraser was appointed on to the Editorial Committee, and soon after that to be joint Editor. He brought to this work an infectious enthusiasm which inspired everyone connected with it, so that the whole mass of material for the Flora was collated and published by the summer of 1939. During these years he organised the weekly summer walks of the

Torquay N.H.S., and used them as a fruitful means of contribution to the Flora, and the Torquay neighbourhood has probably been more closely combed botanically than any other part of the County. Fraser also did much of the work of communicating with the expert referees, and of putting them in touch with the herbaria in the County. At the same time, setting to work himself assiduously to collect fresh material both for present use and future reference, he built up at the Torquay N.H.S. Museum a valuable representative County Herbarium, which had all the critical species and genera examined and named by experts.

In 1938 he had been appointed Botanical Recorder to the Devonshire Association, and as soon as the Flora was published in 1939 he began to get together material for a Supplement, and it is pleasing to know that he saw the publication of this early in 1942 as a *Supplement to the Transactions of the Devonshire Association* for 1941, shortly before his health broke down.

As a botanist Fraser himself would have been the last to claim to be an expert; and this was true only in the sense that he did not specialise in the study of any particular genus or order. But he had a wide and exact knowledge covering all the orders, and being a painstaking, careful worker he was quick to see what should be sent to the specialist for further examination.

The chief characteristics by which Fraser will live in the memory of his friends are his enthusiasm and energy. No task was taken up without his throwing himself completely into it as a work to be done, and to be done in the best possible way. Along with this was a capacity for inspiring in others the same enthusiasm, so that he created a body of keen helpers, whom by his tact and leadership he was able to make into a team. Under his guidance the Torquay N.H.S. excursions made a great contribution to the Botany of Devon, and he has left a memorial to himself in the Herbarium at the Society's Museum. He found it a collection of dried plants, and left it—and in this he was ably and untiringly helped by his wife—a herbarium, well arranged and representative of the County Flora, which should be of great value to future investigators. His loss is greatly felt in the district and those who were associated with him in his work, will always keep a grateful memory of the inspiration which he provided.

FRANCIS M. DAY.

PATRICK MARTIN HALL, M.C., F.S.I., F.L.S. (1894-1941). Patrick M. Hall, well-known and much-esteemed among British field-botanists, suffered a breakdown in health at the beginning of June 1941. Complete rest was ordered and, his eyesight being impaired, he was at once cut off from the solace of plants, books and correspondence, interests which would normally have occupied such a period of bodily inactivity. War-work had made impossible his annual botanical holiday in 1940, but he hoped that early August 1941 would bring such recovery as would allow him to spend a fortnight in his favourite Perthshire locality. For a time it seemed as if his hope would be realised, and in July he was optimistic about his condition. His sudden death on 5th August was a great shock to his family and friends.

By profession a chartered surveyor, partner in the Portsmouth firm Hall, Pain and Foster, and well-known in the south of England as a land-valuer, his recreational interests included field-botany, cricket, and the collection of old glass. During the 1914-18 war he served in the army in India and in Mesopotamia, winning military honours, attaining captain's rank, and being twice mentioned in despatches. The outbreak of the present war saw his appointment as County Chairman of Auctioneers for Hampshire, a post under the Food Ministry which carried duties enough to leave scant time for hobbies.

Hall was the only son of the late Ernest Hall, F.S.I., of Portsmouth, and was born on March 14th, 1894. He was educated at Winchester College, and Oriel, Oxford, as a classical scholar. Being interested in nature as a boy he joined the College Natural History Society and gravitated to the botanical side of its activities. This was the time he became interested in Violets and very soon he was in touch with Mrs E. S. Gregory, the authority on the genus in Britain thirty years ago. Many were the specimens sent to her for identification and comment. Then, too, he began his study of the Orchidaceae, and in the report of the Winchester College Natural History Society, pp. 8-12, 1912-3, published a paper on local orchids with R. B. Ullman. This article is noticed by Dr G. C. Druce in our Report for 1913 and several of the orchid hybrids referred to form the subject of plant notes in that Report. It would be about this time that Hall joined the Botanical Society, possibly when up at Oxford. His name first appears as a member in the Report for 1914, issued in 1915, by which time he was serving in the Army abroad.

On demobilisation he entered his father's business and qualified as a chartered surveyor, becoming a partner in the firm. He was a past Chairman of the Hants, Dorset and South Wiltshire Branch of the Chartered Surveyors' Institution, and an outstanding member of the Council of the Royal Counties Agricultural Society.

From about 1927 (he married in 1920) Hall began to take a much more active interest in field botany than hitherto and commenced to extend his herbarium, paying special attention to the plants of Hampshire. Being a member of the Hants Field Club, he soon was looked to as the authority on the plants of the county, and wrote several papers in the Club's *Proceedings*, chronicling the discoveries made up to the time of his death. His field work rapidly brought him into personal touch with most of the active members of the Botanical Society, especially Dr Druce and W. H. Pearsall.

On the death of the last named in 1936 Hall was appointed Hon. Editor of the Society's Reports and effected a raising of the standard of excellence and accuracy of our Reports, with special emphasis on the accuracy as related to plant records. Having become recognised as an authority on British Violets, Pansies, Bladderworts and Orchids, he had an extensive correspondence with British and Continental botanists. Holidays were nearly always spent on botanical excursions; the writers have, in conjunction with Dr W. A. Sledge especially, many happy memories of days on Scottish mountains in sun and rain. We were always keen to explore and to collect plants from places other than the usual recorded stations and by following this policy often made most interesting discoveries. Hall was invariably enthusiastic in looking over "new ground" or trying to verify old or doubtful records, even in a fairly well-worked county like Hampshire. He knew intimately the New Forest and all the scarce plants found within its boundaries, and was greatly concerned over the diminution in quantity of some of them through over-collecting and other causes. It was always a joy to him to see a new plant, either to Hampshire, or one he had not seen *in situ* before. In Scotland especially this was noticeable; in Perthshire, where we saw *Carex atrofusca* in all its known stations; and on Deeside, going to Ben Avon one day for *Saxifraga caespitosa* and *Luzula arcuata*.

Apart from his botanical activities Hall was deeply interested in old glass, being a member of the Glass Collectors' Circle and an expert on early English wine glasses. He had a peculiar flair for discovering unusual specimens, of which he made a large and representative collection. As a cricketer he played for Hampshire and was for sixteen years honorary secretary of the Hampshire Hogs besides being a member of the M.C.C.

It is difficult to do justice in a paragraph to the character of the man himself. To those of us who counted him among our friends, there is nothing that can be said; to those, less fortunate, to whom he was only a signature, such a notice as this can convey little of his quality. Big in mind as in frame, light-hearted as a boy yet shrewd in assessment, devoid of affectation as of malice, ever-ready to lend his great organising ability to promote an activity even when circumstances prevented his own participation in it, it is trite to say his place will be hard to fill. Perhaps he would be content to have us sum him up as typical of the best kind of English gentleman, always ready to treat a minor calamity as a joke and a major one as just another hurdle to be taken. This was the man we knew, and for us, privileged in sharing his company, there are places, incidents, phrases even, forever inseparable from the name and memory of P. M. Hall.

His Herbarium has been bequeathed to the Department of Botany, Natural History Museum, with the exception of the Hampshire and Isle of Wight plants, which are to go to the projected County Museum at Winchester. In 1940 Hall, with the help of Mr Wallace, began to form a bryological section of the Hampshire collection.

R. Mackechnie and E. C. Wallace.

Some references to papers by P. M. Hall may be useful:—

ORCHIDS.

1931: "Some Notes on British Orchids in 1930" (*B.E.C. 1930 Rep.*, 442-453).

1933: "Three Hybrid Orchids" (*B.E.C. 1932 Rep.*, 364-366).

1934 : " Abnormal Flower of *Cephalanthera* " (*Journ. Bot.*, lxxii, 49-51).
" Notes on British *Orchidaceae* " (*B.E.C. 1933 Rep.*, 670-681).
1936 : " An Abnormal Inflorescence of *Orchis mascula* L.—New Hybrid Orchid [×*O. latirella*] " (*Journ. Bot.*, lxxiv, 326-329).
1937 : " The Irish Marsh Orchids " (*B.E.C. 1936 Rep.*, 330-352).
1939 : " Natural Bi-generic Hybrid Orchids in Great Britain " (*S.E. Nat. and Antiq.*, xlvi, 23-35).

UTRICULARIA.

1939 : " The British Species of *Utricularia* " (*B.E.C. 1938 Rep.*, 100-117).

HAMPSHIRE FLORA.

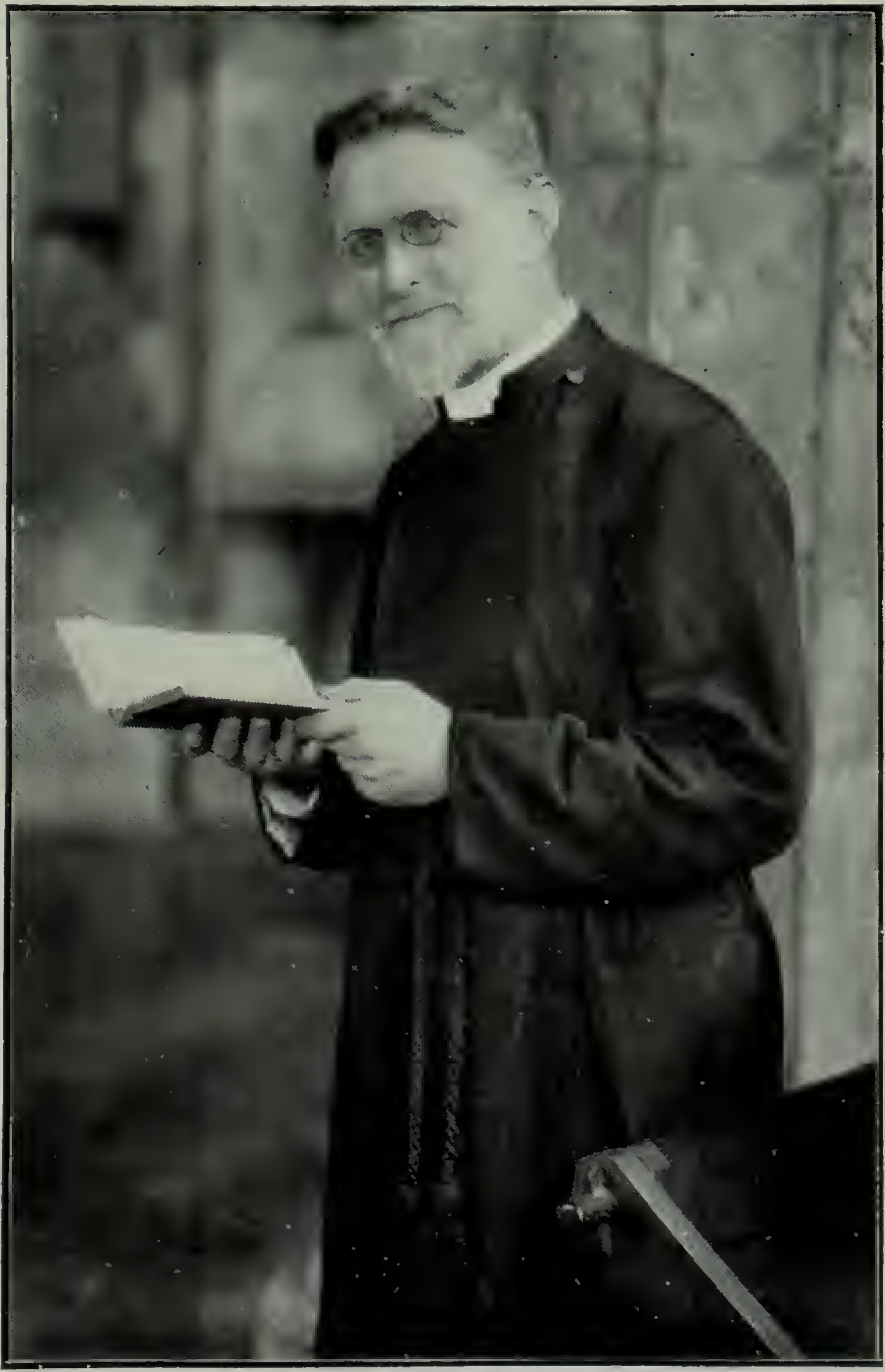
1941 : " Hampshire Plant Notes " [followed by] " Wool-Aliens at Portchester, 1939 " (*Papers and Proc. Hampsh. F.C. and Arch. Soc.*, xv, 62-76).

The Rev. H. J. RIDDELSDELL, M.A., A.L.S. (1866-1941), was a well-known British botanist, and his death, which occurred on 17th October 1941, has deprived his many friends and colleagues, who at various times collaborated with him in local flora work, of a happy association which will be much missed. British Botany was to him an absorbing hobby during the greater part of his life, and his never-flagging enthusiasm enabled him to accomplish an immense amount of collecting and systematic work. He specialised to some extent in critical genera, and particularly in the large genus *Rubus*, on which he became an authority.

Entering business after leaving school, he studied after business hours with such success that he gained the B.A. degree of London University and an Exhibition for Jesus College, Oxford, where he graduated, gaining the B.A. degree with honours. He obtained the Hall-Houghton Senior Greek Testament Prize and was enabled to stay up at Oxford for another two years. It was then that, making the acquaintance of a local botanist, he first became interested in botany, from which time his interest in the science never flagged.

At the age of 25 he took Holy Orders, when he became one of the curates to the parish church of Leeds. In 1897 he went as Sub-Warden to St Michael's Theological College, Aberdare, and later, when the College moved to that city, at Llandaff, 17 years in all. Here he began botanizing in earnest, and eventually produced " The Flora of Glamorgan," published as a Supplement to the *Journal of Botany* in 1907.

In the year 1908 the Rev. H. P. Reader had resigned the editorship of the *Flora of Gloucestershire*, which was being sponsored by the Cotteswold Naturalists' Field Club, and it became necessary to find a new editor. Riddelsdell was offered the post and accepted it. An immense amount of manuscript thereupon came into his hands, including not only the three years' accumulations of his predecessor, but also a mass of records and lists made by Boulger and his workers thirty years previously. In 1909 Riddelsdell produced the first of many Reports on



REV. H. J. RIDDELSDELL.

MUS.

the Flora in the *Proceedings* of the Club. He revised the botanical districts into which the county had been divided, making seven to correspond with the drainage areas.

He increased the number of local secretaries, consulted the National and local herbaria and gave detailed instructions to Club members as to areas to be worked and the nature of the plant lists required. His subsequent criticisms of lists sent in were apt and instructive; there was too large a proportion of aliens, rarities and favourite plants such as orchids, and not enough common plants and critical species; it was important to know where common plants do *not* occur. In 1911 he issued a list of desiderata for specified localities.

In 1914 he became Rector of Wigginton in Oxfordshire. The War then intervened and the work was partially suspended. After the War he became Vicar of Bloxham, and there was little time for botanical work, what there was being reserved for the Rubi. He was associated with, and later carried on the work of, the Rev. W. Moyle Rogers in the study of this genus; afterwards with W. C. Barton he described a number of new *Rubus* species.

In 1932 the work on the Gloucestershire Flora was at a low ebb, and the Club appointed a Botanical Sub-Committee under the Secretaryship of the late C. W. Hedley, in order that there should be a definite organization. In 1936 Riddelsdell retired from parish work and went to live at Goring in Berkshire. From now on he had at last the leisure to put all his energy into the Flora, which he had come to consider his life's work. The manuscript was typed in batches, which were passed through the hands of specialists, the Introduction and nomenclature were set in hand, and a final revision had begun and all neglected areas explored when in 1938 he became seriously ill and was compelled to discontinue all work. After thirty years of work it was tragic that he should not have had the satisfaction and reward of completing the Flora, and the sympathy of botanists generally was accorded him. It remained for the Committee to carry on the work, which it has fortunately been possible to do up to the present time.

Up to the time of his illness, his mind was as acute as ever, and his enthusiasm, which was especially in evidence at field meetings, undiminished. No tramp was too long or bog too wet for him in his search for suspected species.

He was a scholar, of devout mind and courteous disposition, who, though forming definite opinions, was always willing to defer to those of others, with whom his association was at all times a pleasure.

He wrote many articles and notes in the *Proceedings of the C.N.F.C.* Commencing in 1913, he wrote on *Epipactis atroviridis*, *Helosciadium*, Distribution of *Rubus* in Gloucestershire, *Carex tomentosa*, Critical Plants recently identified, and The Phanerogamic Flora of the Cotteswold Hills. In the *Journal of Botany* his writings were always of great interest to county botanists. Commencing in 1905 with an account of Lightfoot's Visit to Wales in 1773, he contributed notes on *Poa palustris*, *Ranunculus ophioglossifolius*, *Montia* segregates, *Draba muralis*, *Himantoglossum hircinum*, *Ranunculus Lingua*, and many notes on Gloucestershire records. W. R. PRICE.

Mr Barton writes:—He was a copious collector and sent regularly to the Botanical Exchange Club a large parcel with many useful notes. [He was also a prominent member of the Watson Botanical Exchange Club, becoming one of its principal Referees in 1915, and continuing in that capacity until the winding up of the Club in 1934.—EDS.]

Under the guidance of the Rev. W. Moyle Rogers he made a special subject of the difficult and critical genus *Rubus* and visited many parts of Great Britain to study the brambles *in situ*. When Rogers died his books and manuscripts with an invaluable selection from his *Rubus* specimens came into Riddelsdell's hands. With these aids he determined specimens for collectors and extended his own knowledge. The more important conclusions reached by Rogers were printed in the *Journal of Botany*, 1920-1921, and in 1930 the distribution records of *Rubus* according to Rogers' and Riddelsdell's determinations were brought up to date. From 1921 he worked at the genus in collaboration with the present writer and a number of new forms were described.

The work, however, to which he gave most of his leisure and thought was *The Flora of Gloucestershire*, sponsored by the Cotteswold Naturalists' Field Club. He accepted the editorship in 1908 and thenceforth spent much time and labour in dealing with the mass of records and lists already accumulated and in reorganising and directing the work of the Club members. In the *Proceedings* of the Club he issued many reports on the Flora and articles on matters of local botanical interest as well as (in 1933) our joint paper on "Some *Rubus* problems in the light of Genevier's herbarium." After his retirement in 1936 his time and energies were devoted to the completion of the Flora and a final revision had made some progress when illness compelled him to leave the task unfinished.

With Riddelsdell his vocation always came first; he was a scholarly and faithful servant of the church, personally devout and unworldly and beloved by all who knew him. From early years he made full use of leisure and considerable intellectual gifts, allowing no difficulties or discomforts to interfere with his purpose. His happy and appreciative temperament, his energy and enthusiasm, his quick eye and manifold interests made him a delightful companion in the field and in the study.

He was elected Associate of the Linnean Society of London in 1925. His herbarium includes a large collection of *Rubus* from many parts of Great Britain and many *Hieracia* from Wales; incorporated with that of the present writer, it is preserved in the herbarium of the British Museum. W. C. BARTON.

RANDOLPH WILLIAM ROBBINS, who had been a member of this Society since 1929, died on August 1st, 1941, at Torquay, to which he had evacuated. From time to time he had contributed notes and records to our Reports, and he supplied many useful records for Salmon's *Flora of Surrey*.

Robbins was a keen and careful botanist, always eager to understand new lines of research, but less willing to undertake the labour of writing up the results of his own observations. For this reason his publications were few, and almost limited to occasional papers in the *London Naturalist*, the last of which, on "Willowherbs," appeared in the latest issue of that journal. He will be remembered chiefly for his share as Joint Editor of *Botanical Records of the London Area*, which was published as a supplement to the *London Naturalist* from 1929 to 1936.

His Herbarium and collection of botanical books have been left to the London Natural History Society, of which he was a member since 1892, and of which, after holding most of the offices in turn (including that of President), he was a Vice-President at the time of his death. J. E. LOUSLEY.

DESTRUCTION OF THE HERBARIUM OF THE PLYMOUTH INSTITUTION.

Botanists will learn with regret of the total destruction, during the air raids of the Spring of 1941, of the Herbarium of the Plymouth Institution, which was housed in the Athenaeum, Plymouth.

This herbarium, containing sheets dating back as far as 1836, chiefly comprised specimens of the plants of Devon and Cornwall, and among the collectors represented occurred the names of T. R. Archer Briggs, F.L.S. (author of *The Flora of Plymouth*, 1880); Isaiah W. N. Keys (author of *The Flora of Devon and Cornwall*, 1865-1871); the Rev. J. Jacobs (author of *The West Devon and Cornwall Flora*, 1835-1837); F. P. Balkwill; and the Rev. W. S. Hore.

The collection included many specimens of particular interest to West Country botanists, and several are specially referred to in the *Flora of Devon*, 1939, by Martin and Fraser. One remembers the well-preserved sheets of *Eryngium campestre* L., collected in September 1837 at Devil's Point, Stonehouse, by the Rev. W. S. Hore; *Carduus pycnocephalus* L., gathered on Plymouth Hoe (where, incidentally, it still grows) by Briggs in 1882; *Bupleurum opacum* Lange (labelled in error *B. tenuissimum* L.) from Flag Staff Hill, Torquay, where the Rev. W. S. Hore found it in 1837; and many others too numerous to mention here.

The Athenaeum, the headquarters (with museum and library) of the Plymouth Institution, founded in 1812, was built in the Greek style in 1818 and the collections were in the process of extensive re-organisation when the war intervened. Subsequently, during the severe air raids of March 20th and 21st, the building was damaged. Arrangements were therefore commenced to transfer the herbarium to the care of the Torquay Natural History Society but before this could be effected the Athenaeum was gutted by fire during the terrible air raids of April 21st and 22nd and all its contents, including the herbarium, were utterly destroyed. The loss is indeed a grievous one but, fortunately, Briggs in his *Flora of Plymouth*, has placed on record most of the data indicated on the herbarium sheets and these facts are consequently preserved to us. More serious, perhaps, is the destruction of the fine Scientific Library and of the comprehensive collections of local minerals, rocks and fossils, of which the two former sections had been entirely re-organised.

E. Masson Phillips
(Curator, Museum of the Plymouth Institution).

PERSONALIA.

FLORA OF STAFFORDSHIRE (v.-c. 39).

Mr E. S. Edees, of 19 Dartmouth Avenue, Westlands, Newcastle, Staffs., is collecting material for a *Flora of Staffordshire*, v.-c. 39, and would be glad to hear from any member who has notes or specimens of Staffordshire plants.

DISTRIBUTION OF THE OAKS.

Dr E. W. Jones, of the Imperial Forestry Institute, Oxford, writes: I am anxious to obtain information regarding the distribution of *Quercus Robur* L. (*Q. pedunculata* Ehrh.) and *Q. petraea* Liebl. (*Q. sessiliflora* Salisb.) in Britain. Both species have been recorded from practically every vice-county, but the records in local Floras mostly give insufficient information on their relative abundance and their modes of occurrence. Records of the following kind for any district will be welcome:—

Do either or both species occur?

What is their relative abundance?

In what habitats are they found—e.g. in woods, hedgerows, parks, etc.?

Is there any reason to suspect planting of either species?

For particular woods: does either species occur in pure stands? If not, in approximately what proportions are they mixed? What is the general nature of soil and vegetation in the woods in question?

To what species do individual oaks of exceptional age belong?

Records of *Q. petraea* from East of the Pennines and from the midland and southern counties, and of *Q. Robur* from western counties and Wales, and of both species from Scotland and Ireland, will be particularly useful.

If there is any doubt as to the identity of a tree, specimens should be sent: a few well-developed leaves from one of the twigs of the crown (not from an epicormic shoot) is usually adequate.

SEDUM RUPESTRE AND S. FORSTERIANUM.

Mr R. Lewis, of Monmouth, wishes to cultivate for comparison any forms of *Sedum rupestre* and *S. Forsterianum* from the British Isles, and would be obliged if members able to do so would send him roots for the purpose. If there appears in any locality to be variation, he would like samples of the variants—green and glaucous foliage, smaller and larger flowers, more or less golden colour, etc. Specimens from Cheddar, St Vincent's Rocks, and the type locality of *S. Forsterianum* in Cardigan, would be particularly welcome.

T. B. FLOWER'S HERBARIUM.

The present whereabouts of T. B. Flower's herbarium is unknown, and recent work on the *Flora of Wiltshire* would be greatly helped if it could be consulted.

Flower wrote a flora of Wiltshire, first issued in the *Wilts. Archaeological and Nat. Hist. Mag.*, vol. iv onwards, published at Devizes 1857-74. He was a careful collector of plants and in communication with most of the leading field botanists of his day.

J. W. White (*Fl. Bristol*, 1912) stated that at that time the herbarium was in the possession of Dr Harper, of Batheaston. Enquiries started in 1937 established that Dr Harper had died in 1915 and that the Batheaston house was now in the possession of his last surviving daughter, Miss Maud Harper, but was unoccupied. A neighbour believed that the herbarium was still at the house. Eventually Miss Harper was traced to a house at Lansdown, Bath. On being interviewed, this lady stated that the collection, together with Flower's books, had been sold to Messrs Gregory, booksellers, Bath. The collection was, she said, in a box, but the size indicated—about the size of a tea-chest—seems totally inadequate to hold what must have been a large herbarium. Mr Gregory, on being approached, readily remembered the purchase of the books, but was certain that he did not buy the herbarium. By his courtesy, we were allowed to question the assistant who collected the books, but were unable to elicit further information. Great help has been received from Miss M. Horsell and Mr T. H. Green, of Bath. Any further information will be welcomed.

J. D. Grose.

NATURE RESERVES INVESTIGATION COMMITTEE.

In order to obtain material to lay before their parent body, the Conference on Nature Preservation in Post-War Reconstruction, in connexion with the proposals of the Addison, Uthwatt, and Scott Reports on National Parks, Compensation and Betterment, and Land Utilisation in Rural Areas respectively, this Committee has set up Sub-Committees, each covering a few counties, to investigate and make definite proposals concerning areas requiring preservation and/or protection, for Scientific and Economic purposes, the Enjoyment of Nature by the Public, or Education in Natural History. Such areas would include *National Parks*, smaller *Nature Reserves* of scientific interest, and *Scheduled Areas* to be preserved from "development." The *Nature Reserves* may be *Habitat Reserves* (ecological types needed for study, etc.) or *Species Reserves* (for the protection of rare species, to which access may be controlled, or even sanctuary given). Management may be National, or Local if "*Local Habitat Reserves*" or "*Local Species Reserves*" are concerned; Local Reserves would be owned and managed by Societies, local authorities, or individuals, in contrast to the central administration envisaged for National Reserves.

If any of our members are interested in the preservation of particular areas specially known to them, or of particular species in any area, and wish to make any proposal for the consideration of the Sub-Committee dealing with the county concerned, they should send the information to the Acting Secretary without delay, since the Sub-Committees have to report at an early date.

The Acting Secretary will pass on such proposals to the General Secretary, Dr Herbert Smith, who will distribute them to the Sub-Committee concerned. To avoid the necessity for copying, *each separate proposal should be sent in on a separate piece of paper.* Proposals should be as detailed as possible, including, where possible, data of area of land, present ownership, estimated costs, etc. Information should be marked *confidential* where desired, to avoid danger to rare species.

A. J. WILMOTT.

PLANT NOTES.

[In the case of direct contributions the name of the author of the note is printed in small capitals. When the note is an abstract, the author's name is followed by the reference, either in full or by date referring to the Bibliography. The abstractor is indicated as under "Abstracts from Literature."

Note to Contributors. Will those sending in Plant Notes please keep to the form adopted in the recent Reports. If the note comes from a publication, and more than one note is extracted from a single paper, first set down the "reference" in the same form as is adopted in the published "References" in the Reports, i.e., author's surname, comma, initials, semicolon, date of publication, colon, title of work, (and if from a serial publication) semicolon, followed by the name (abbreviated) of the serial, the volume, and pages (first and last). The Plant Note itself starts with the *B.P.L.* number and name of the genus or species concerned. If the note concerns one vice-county only, start the note with this information as is done with Plant Records. It would be a great convenience if all notes were prepared by different contributors on slips of the same size, that preferred being 8 inches by 4 inches, the long edge to be treated as the top of the page.—ED.]

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37. ARABIS. "A monographic study of *Arabis* in Western North America" (Rollins, R. C.; 1941: in *Rhodora*, xliii, 289-325, 348-411, 425-481) deals with the following British species:—*A. glabra* (L.) Bernh. (var. *typica* Hopkins, 1937: pubescence of stem simple or rarely forked, spreading; var. *furcatipilis* Hopkins, 1937: pubescence of the stem several-branched, appressed, smaller than in var. *typica*—the var. *lilacina* (O. E. Schulz, 1933, as *Turritis glabra* var.) with purplish to lilac-coloured buds is not considered worthy of distinction as the colour is ephemeral)—widely distributed in the mountains. *A. hirsuta* (L.) Scop., which is widespread and is subdivided into four American varieties (one of which is var. *glabrata* Torr. & Gray, 1838; non Doll, 1862).—[Wi.]

54/18(2). BRASSICA **integrifolia** (West) O. E. Schulz var. **carinata** (A. Br.) O. E. Schulz. Druce, F., and Sandwith, N. Y. (1941: An interesting Crucifer on a London shelter; *J.B.*, lxxix, 86-87) record the occurrence of this species on the raised top of a dugout shelter in Chelsea Embankment Gardens.—[Wa.]. The specimens closely resemble those of *B. juncea* in general appearance, but the fruit is most distinctive, shorter, with much shorter (4-6 mm. long) broad flat beak. The lowest leaves are often more or less pinnatifid, but often entire, obovate (dentate). The petals are bright golden yellow, up to 13 mm. long. Its native home is not certainly known, but existing records are from N.E. Africa. It was long cultivated in the neighbouring Chelsea Physic

Garden, a specimen in Herb. Thos. Moore being dated 1859, but it was thought to have been lost since 1936.—[Wi.]

55/1. DIPLOTAXIS TENUIFOLIA (L.) DC. Said by A. E. Jones and J. Small to smell of foxes (at Badsey, Worcs.) (*Trans. Worc. Nat. Club*, ix, 286).

59. CAPSELLA Medik. The genetical analysis of certain morphological characters in various species is described by Shull, G. H. (1929: Species hybridizations among old and new species of Shepherd's Purse; *Proc. Internat. Cong. Plant Sci., Ithaca, New York*, 1926, Vol. i, 837-888). Controlled cultures were made of plants received from a wide range of localities. Ten species and two subspecies are recognised, falling into two groups: (1) the *Bursa-pastoris* group, (2) the *rubella* group. Crosses between species within the same group yield more or less fertile F_1 hybrids, while crosses between two species of different groups give sterile F_1 hybrids. The *Bursa-pastoris* group has chromosomes $n = 16$ and is considered to be a more recent derivative of the *rubella* group whose chromosomes are $n = 8$. One new subspecies and five new species are described. One of the latter, *Bursa penarthae*, is British, being based on a specimen collected at Penarth, Wales, by A. H. Trow on September 23, 1913. A photograph of the type specimen is given. The species is said to be "characterised by proximally tapering capsules, and rosette leaves of partially inhibited *rhomboidea* type."—[J. P. M. Brenan.]

87/2. HELIANTHEMUM NUMMULARIUM (L.) Mill. A form with cream-coloured flowers is recorded for several localities in Wiltshire (v.-cc. 7 and 8) and one with pure white flowers at Milk Hill (v.-c. 8)—(Welch & Grose, 1942, 72). I found a single plant with pure white flowers on the Devil's Dyke near Newmarket in 1910, A. J. WILMOTT.

100/9. CERASTIUM TETRANDRUM Curt. var. **pusillum** Wilmott. Wilmott, A. J. (1941: Annotationes Systematicae. VI; *J.B.*, lxxix, 102) describes this variety from dunes at Luskentyre, South Harris, Outer Hebrides.—[Wa.] It is a miniature edition of the species, with sepals only 3 mm. long.—[Wi.]

†153/6g. MEDICAGO MINIMA (L.) Bartal. var. **pulchella** (Lowe) Lowe—(1868: *Man. Fl. Madeira*, 166); *M. pulchella* Lowe (1838: *Trans. Cambr. Phil. Soc.*, vi, reimpr. 25). 6, N. Somerset; waste ground, Bristol, with typical *M. minima*, 1941. In this variety the spines on the fruit are reduced to tubercles. New to the British List. Occurs in the Atlantic Islands and Italy, and presumably elsewhere in the Mediterranean region, C. I. and N. Y. SANDWITH.

166/3. ASTRAGALUS DANICUS Retz. In the *B.E.C. Report* for 1936, page 248, Mr J. D. Grose gave a list of the records of *Astragalus danicus* in South Wilts. Its continued existence over a wide area of Salisbury

Plain was observed in 1941 when it was seen in great profusion at the end of June to the north and north-east of Bulford Camp, on the chalk downs used as military ranges.

The old Marlborough Road runs across the area, which stretches west to Silk Hill and eastward across Nine Mile Water to Brigmerston Down and Milston Down as far as the Bulford-Tidworth Road. Milston Firs mark the southern limit of the main area but along the roadside it stretches to Sling Down, to near the point where a linear earthwork (shown on 1 in. Map) crosses the road. Small patches were seen south and south-east of The Wig on Ablington Down; between The Wig and Bourne Bottom and at the southern end of Bourne Bottom; also on the Harewarren to the south-west of Tidworth Golf Course; and east of the road, patches occur immediately south of the Shipton Bellinger turning and between there and the point where the county boundary crosses the road. The present eastern, western and southern limits of this main area seem to have been found, but the northward limit may not have been discovered.

The single small patch between Amesbury and Salisbury recorded by the Rev. Canon E. H. Goddard and Major G. Gwatkin in *B.E.C. Rep.* for 1928, page 733, still exists, and another small isolated patch was found in 1940 by Col. Payn in Hampshire near Danebury (*Proceedings of the Hampshire Field Club and Archaeological Society*, Vol. xv, Part I, page 65). This was a new County Record: but the plant should be found west of Shipton Bellinger, though the land abutting on the county boundary here is, or recently has been, arable.

Over the central part of the Wiltshire area, *Astragalus* forms the turf almost to the exclusion of other plants. Junipers occur and a little *Hippocrepis*, *Anthyllis*, *Onobrychis*, *Spiraea Filipendula*, *Rhinanthus*, and *Polygala calcarea* with a very few *Orchis ustulata* and *Senecio integrifolius*. The grasses are *Bromus erectus*, *Koeleria* and Fescues.—B. WELCH.

The known limits of distribution in S. Wiltshire (v.-c. 8) are set out by Welch & Grose (1942 : 73).

185/17c. RUBUS INCURVATUS Bab. var. **minor** W. Wats. Described by Watson ex J. W. H. Harrison *et al.* (1941B): " Folia parva, tenuiter serrata." From the Isle of Harris, v.-c. 110.—[Wa.]

194/7r. ROSA GLAUCOPHYLLA Winch var. **rupicola** Heslop Harrison. Described from North Harris, v.-c. 110.—J. W. H. Harrison *et al.* (1941B).—[Wa.] A distinctive plant with long narrow glabrous biserrate leaflets (10-32 × 5-13 mm.), glandular stipules and petioles, small rose flowers with sepals patent-erect after flowering.—[Wi.]

276/3. PEUCEDANUM SATIVUM (L.) B. & H. It is stated by Major R. McKinley (1938: " Vesicular Dermatitis due to Wild Parsnip;" *J. Roy. Army Medical Corps*, lxxi, 401-404) that rubbing of the skin, when " warm and sweaty," by (a) the broken stem, and (b), the yellow flower, produced blisters (one illustrated) like those due to " mustard gas." Were it not that the yellow flower is mentioned the identification might be dubious, since the author states that " the weed is abundant on Salisbury Plain and is known locally as 'Wild Parsnip,' 'Heel Trot' or 'Hockweed' [sic]. It belongs to the natural order Araceae [sic]. It is variously referred to as *Heracleum*, the common cow parsnip, and *Pastinaca sativa*, the wild parsnip. I am unaware if they are the same." [I have twice in 1943 tried to produce a blister on my forearm without success, but the days were not hot: perhaps other members will report on the matter.—A. J. Wilmott.]

284. Hedera. A paper on the cultivated Hederas has been published by Lawrence, G. H. M., and Schulze, A. E. (1942: *Gentes Herbarum*, vi, fasc. iii, 106-173), in which the varieties of *Hedera Helix* L. are dealt with at great length.—[Wi.]

296/7. Galium palustre L. There are in Britain at least three plants included under *G. palustre* L., viz., a diploid (with 2n = 24 chromosomes), a larger tetraploid (2n = 48), and a still larger octoploid (2n = about 96) [which is probably the plant which in Britain has been called " var. *elongatum* "]. These have different ecological preferences: the diploid grows in damp places which dry out in summer, but the octoploid in the permanently damp or wet zones. *G. debile*, also a diploid (2n = 24), is a distinct species. *G. uliginosum* (2n = 22) is, in the Oxford district, a fen, and not a marsh, plant. Hancock, B. L. (1942: Cytological and ecological notes on some species of *Galium*; *Phytologist*, xli, 70-78).—[Wi.]

336(2). **Chrysogonum** L., *Gen. Pl.*, ed. v, 391, 1754. A member of the tribe *Heliantheae*, one of the genera with perfect but sterile disc florets: the leaves are basal and opposite, the ray flowers in one series, with largish yellow ligules, achenes adnate to two or three scales of the receptacle, but falling away from them.

336(2)/1b. **Chrysogonum virginianum** L., *Sp. Pl.*, 920 (1753), var. **dentatum** A. Gray in *Bot. Gar.*, vii, 31 (1882); *Syn. Fl. N. Amer.*, ed. 2, *Gamopet.*, 243 (1886). Alien, Eastern U.S.A.; sometimes cultivated as a border plant. The variety differs from the typical form in the acute serrations of the leaves. 20, Herts.; gravel pit, Ware, 1942, Miss Eldridge, comm. and det. N. Y. Sandwith.

355/3. **Madia capitata** Nutt. 1841: in *Trans. Amer. Phil. Soc.*, vii, 387; Howell 1890: *Fl. Northwest Amer.*, i, 347. The gatherings noted in *Plant Records* are so uniform and so distinct from the racemose-headed plants recorded as *M. sativa* Molina (*racemosa* Torr. & Gray) that they appear to be specifically distinct, although they are treated as a variety *M. sativa* var. *congesta* Nutt. by Jepson (1925: *Man. Fl. Pl. Californ.*, 1096). The characters given by Howell in distinguishing it are the presence of glands *all over* the plant, the inflorescence being very viscid, the sessile heads in close capitate clusters, and the different shapes of the achenes (of disc almost linear, somewhat quadrangular, of rays oblique pyriform).—A. J. WILMOTT.

368/2c. ANTHEMIS NOBILIS L. var. **discoidalis** J. W. H. Harrison. Disc florets yellow, ray florets absent. Luskentyre banks, S. Harris, v.-c. 110.—J. W. H. Harrison *et al.* (1941B).—[Wa.]

423/1. TARAXACUM OFFICINALE Weber. Curtis, W. M. (1940: *Kew Bull.*, 1-29) discusses the results of some experimental work on " The Structure and Development of Some Apomicts of *Taraxacum*." Morphologically distinct biotypes showed considerable plasticity in habit and leaf form, being influenced by age, the supply of food, light and moisture. A regular sequence of leaf form was noted during the growing season; during the second season some biotypes had the lobed leaves of early spring replaced by a non-dissected type after flowering, while in autumn a lobed leaf again appeared. In three biotypes a slightly different sequence occurred, the autumn leaves remaining entire. In six biotypes the sequence of leaf pattern was repeated in the third and fourth growing seasons, although in older plants the leaves were less regularly lobed and were carried in an erect or sub-erect position in contrast with the flattened position often taken by leaves of young plants. Plants of an apomict having a normally lobed leaf, when grown in the shade and kept dry, formed shorter and more dissected leaves than the control plant. Growth in the shade and in a moist atmosphere for twelve months resulted in the formation of only entire leaves.—[Wa.]

427. SONCHUS. Spontaneous hybrids between *S. asper* (chromosomes 2n = 18) and *S. oleraceus* L. (4n = 32) are described by Barber, H. N. (1941: *Ann. Bot.* N.S., v, 375-377): it is sterile (3n = 25), and the auricles of the leaves are figured as showing features of both parents.—[Wi.]

427/2b. SONCHUS ARVENSIS L. var. LAEVIPES Koch. 17, Surrey; Epsom Common, 1941. These plants attracted attention from a little distance as differing from the normal form of *S. arvensis* in their larger flowers, more slender habit, and shiny leaves. Closer investigation showed that the peduncles and involucres were completely glabrous. The habitat was a depression on clay, which Mr Wallace tells me was the site of a pond which has long been drained It is now clothed with coarse grasses, a few bushes, and vegetation characteristically associated with moist clayey places. In Central Europe the var. *laevipes* is usually found in similarly moist spots, and is a much more distinct plant than the forms from cultivated land with a few glandular hairs to which the name has sometimes been applied in this country, J. E. LOUSLEY.

457.—LIMONIUM. In " Chromosome Studies in some British Species of *Limonium*," Choudhuri, H. C. (1942: *Ann. Bot.* N.S., vi, 183-217) gives the following data for material obtained at Blakeney in Norfolk: *L. bellidifolium* Dum. (2n = 18); *L. binervosum* Salmon (" 2n = 32 "); *L. vulgare* Mill. (" 2n = 32 "); *L. humile* Mill. (as " *L. rariflora* O. Kuntze"—"2n = 36"); ×*L. Neumani* (n "usually $16_2 + 2_1$"), but irregularities occur. Broad-leaved forms of *L. binervosum* which show some irregularity ("$9_2 + 7_1$") are considered to be possible hybrids derived from later generations of *L.* **bellidifolium** × **binervosum**.—[Wi.]

460/2. PRIMULA VULGARIS Huds. The Primrose is cultivated at high elevations (c. 6000 ft.) in Ceylon in the region of high rainfall: several plants, previously normal, after transplanting to a lower elevation, developed abnormal flowers, showing more or less pronounced phyllody of the calyx, some tetramery, and some abnormal stamens.—Bond, T. E. T. (1941: *New Phytol.*, xl, 152-156).—[Wi.]

465/1. TRIENTALIS EUROPAEA L. Matthews, J. R., and Roger, J. G. (1941: *J.B.*, lxxix, 80-83) discuss variation in this plant. There is much variation in length of runners, leaf size and breadth, and number of leaves in each whorl. The number of leaves varies from 3 to 10, but six leaves are of greatest frequency; dwarf ericetal plants usually seven-partite, but five- to six-partite and eight- to nine-partite corollas are met with. Seed output varies from one to eighteen, with an average of eight, seeds per capsule. The var. *nana* Druce was produced by transplanting typical woodland specimens and growing them under conditions of increased light and wind; there is, therefore, little doubt that the dwarf form of the plant is an ecological state induced by habitat conditions. Experimental study of the germination of this species is discussed by Matthews, J. R. (1942: *J.B.*, lxxx, 12-16). The experiments suggest that increased germination is obtained after freezing. In view of its northern distribution, and its greater frequency in north-east Scotland than in most parts of the country, it is possible that winter temperatures may have some definite effect on the germination capacity of the seeds. The experiments show that germination is considerably hastened if the seed has undergone preliminary freezing.—[Wa.]

480/8. GENTIANA GERMANICA Willd. The seeds vary in size from .35 mm. to .9 mm. diameter, the size being best given as (.35-).55-.75(-9) mm., presumably in specimens from Hertfordshire (Salisbury, E. J.; 1943: Note on the variation in the seed size of *Gentiana germanica*; *Trans. Hertfordsh. N.H.S. and F.C.*, xxi, 346-347).

497/1. SYMPHYTUM OFFICINALE L. A form with bright scarlet flowers, but otherwise normal, is recorded from 8, S. Wilts., Patney, by Welch and Grose (1942 : 75).

545. EUPHRASIA. Callen (1941) describes two new varieties: *E. confusa* var. **maciana**, from several localities between Perthshire, Iona (Mid-Ebudes) and West Ross, distinguished from the typical form in being more robust, with larger, broader, glandular leaves and broader cap-

sule; *E. nemorosa* var. **imbricata**, from Roxburghshire (the Eildons above Melrose) and Eigg (N. Ebudes), a short (3-9 cm.) slender erect-branched plant with short internodes and small grey-green leaves, imbricate spikes, and capsule pilose throughout.—[Wi.]

573/1. PRUNELLA VULGARIS L. Broome (1941: *N.W. Nat.*, xvi, 202-3) reports the occurrence of a form with the leaves arranged in whorls of three at Dolywern, Denbighshire, v.-c. 50.—[Wa.]

615/3. POLYGONUM BISTORTA L. The British plant possesses leaves with the lower surface glaucous and puberulent on the veins, and is the variety *puberulum* G. Beck, *Fl. Nied.-Oesterreich*, i, 322 (1890).—Britton (1941).—[Wa.]

615/4a. POLYGONUM VIVIPARUM L. f. **Roessleri** G. Beck in *Reichb. Ic.* xxiv, 84 (1906). A variety of *P. viviparum* from Braemar, v.-c. 92, with the veins of the lower surfaces of the leaves clothed with partly rust-coloured hairs is referred by Britton (1941) to this form.—[Wa.]

615/9c. POLYGONUM HYDROPIPER L. var. **obtusifolium** A. Br. in *Flora*, vii, 356 (1824). Britton (1941) refers specimens collected at Ravensbourne, Kent, in 1903 by W.H.G. to this variety.—[Wa.] The leaves of the variety are oblong-lanceolate (20-25 × 6-9 mm.) obtuse, contracted into a short petiole or subsessile: the plant is more or less prostrate, with adventitious roots from lower nodes.—[Wi.]

615/27. POLYGONUM SAGITTATUM L. Meisner describes two varieties, α *sibiricum* and β *americanum*. The plant established in Ireland belongs to the latter variety. The Asiatic plant is less armed, with smooth or scabrid leaves bearing few pricklets on the mid-rib.—Britton (1941A).—[Wa.]

664/2. SPIRANTHES SPIRALIS (L. emend.) C. Koch. Major McClintock reports that about 50 very fine Lady's Tresses appeared in 1941 in an unmown lawn (see under *Orchis mascula* L.). "They had shown their heads before between mowings, but were better and more numerous than ever. But they seem to have exhausted themselves, because not one was to be seen this year" (1942). [It should be determined whether they have died or whether they are only feeding up again.—ED.]

668/3(4). EPIPACTIS **pendula** C. Thomas. A new species, described by Thomas, C. (1942: *J.B.*, lxxix, 200-205) from the neighbourhood of Formby, v.-c. 59, S. Lancashire.—[Wa.] It is allied to *E. dunensis* (T. & T. A. Steph.) Godfery, which also occurs in the vicinity, but attracted attention by its more robust habit, much greener colour, and pendulous flowers. Its differences from allies are set out as follows:—From *E. vectensis*: greater height (26-56 cm.), shorter bright green leaves, larger more-flowered racemes, and longer ovaries, lanceolate acute (rarely acuminate) sepals and petals, which are fulvous-tinged outside; from *E. leptochila*: stems frequently aggregated, habit more compact and robust, pendulous flowers on weak pedicels, much longer ovaries, sepals and petals not rose-tinged, hypochile colourless within.—[Wi.]

669/1c. ORCHIS PURPUREA Huds. f. **Brookei** Wilmott. This form, which has the middle lobe of the labellum undivided and narrow, about twice as long as broad, more or less oblong but slightly contracted in the lower third, with the distal part either narrowly elliptic or long triangular, and terminating in an apiculus, is described by Wilmott, A. J. (1942B: *Annotationes Systematicae.* X; *J.B.*, lxxx, 16-17).—[Wa.]

669/14. ORCHIS MASCULA L. Major McClintock writes that owing to the war an area of about 1000 square yards of lawn (at Withyham, Sussex) was left unmown in 1941, and in this patch there appeared not less than 950 Early Purple Orchids, the existence of which was quite unsuspected; they showed every shade from the palest to the richest purple. Their reappearance was looked forward to in 1942 but very few (between 20 and 50) appeared. (Cf. *Spiranthes spiralis* (L.) C. Koch.)

684/1b. NARCISSUS OBVALLARIS Salisb. A double flowered daffodil growing with *N. obvallaris* Salisb. near Tenby, and supposed to be a sport from that species, is *N. Telemonius plenus.* As *N. obvallaris* is confined to one field and is associated there with a species which cannot be assumed to be a British native, it must be concluded that the two plants were originally introduced at this station at some remote date. —Pugsley, H. W. (1941A: *J.B.*, lxxix, 27-28).—[Wa.]

737. POTAMOGETON. Dandy and Taylor (1941: Studies of British Potamogetons. XV. Further Records of Potamogeton from the Hebrides; *J.B.*, lxxix, 97-101) record ×*P. Billupsii* Freyer, *P. alpinus* Balb. and ×*P. sparganifolius* Laest. ex Fr., all new to South Uist, v.-c. 110; ×*P. prussicus* Hagstr. (*P. alpinus* × *perfoliatus*) from Lochan near Oban Uaine, Benbecula, South Uist, and the island of Colonsay, South Ebudes, and collected by J. W. Heslop Harrison in 1940, is new to the British Isles.—[Wa.] × **P. prussicus** Hagstr. (1908: in *Bot. Notiser*, 103-106; 1916: *Critical Researches*, 148) combines the characters of the putative parents with which the British plants from Colonsay were growing, but none of the specimens possessed a flower spike from which final evidence of hybridity could have been obtained: the hybrid has been recorded for Norway and Germany.—[Wi.]

746/2. SCIRPUS MARITIMUS L. "The Section *Bolboschoenus* Palla," which includes the British species *S. maritimus*, is dealt with by Beetle, 1942 [*Amer. J.B.*, xxix, 82-88]: eight plants are distinguished, all of which have sometimes been placed under *S. maritimus.* The characters by which the British plant is separated in the key are:—Achenes compressed—to sharply trigonous; style 2-3-fid [not "lenticular; style 2-fid"]: leaf normally not over 6 mm. broad; secondary roots not conspicuous [not " leaf commonly 8-10 mm. broad; secondary rootlets conspicuous "]: style normally 2-fid; spikelets ovate acute [not " normally 3-fid "].—[Wi.]

746/7. SCIRPUS CESPITOSUS L. In a Study of *Scirpus* sect. *Baeothryon*, Beetle (1941: *Amer. J.B.*, xxviii, 471-3) distinguishes the two plants which have been called var. *germanicus* (Palla) Asch. & Graebn.: and var. *austriacus* (Palla) Asch. & Graebn., as *S. cespitosus* and *S. cespitosus* var. *callosus* Bigelow (1824: *Fl. Bost.*, ed. 2, 21) respectively. The earliest varietal name for the typical plant appears from the synonymy to the var. *nemorosus* Roth (1789: *Tent. Fl. Germ.*, ii, 53; = var. *vulgaris* Rchb. (1827: in *Moessl. Handb. der Gewachsk.*, 74)). Details of American distributions of this species and *S. Hudsonianus* (Michx.) Fernald (=*Eriophorum alpinum* L.) are given.—[Wi.]

753/51(2). CAREX **bicolor** All. Harrison, J. W. H. (1941: *J.B.*, lxxix, 111-113; also 115) records this species as new to the British Isles from the Isle of Rhum, v.-c. 104, North Ebudes. Polunin, N. (1941: *J.B.*, lxxix, 158-160) discusses the geographical distribution.—[Wa.] *C. bicolor* is a very distinct-looking sedge, in the north a small plant about three inches high, but sometimes considerably taller, shortly creeping with narrow bluish-green leaves and arching culms bearing more or less pendulous spikes of " pastel-green fruits peeping out from behind dark scales " (Polunin, 1940: *Bot. E. Canadian Arctic*, p. 121). The upper spikelets are rather aggregated and shortly pedunculated, the lowest more distant and longer stalked; all are ovoid with roundish utricles (stigmas 2); the top one has male flowers at the base and the rest are female. The lowest bract is leaf-like and sheathing, the upper with short green tips. It is an arctic-alpine species growing on barish soil near water. As an arctic plant it is probably circumpolar, being often widespread and plentiful, but it is easily overlooked. In Europe it occurs in Iceland and Arctic Scandinavia and further south in the Pyrenees, the Alps, and the Carpathians.—[Wi.]

847. PTERIDIUM. In a revision of this genus by R. M. Tryon, jr., 1941, the single wide-spread species is subdivided into twelve varieties. exclusive of the numerous minor modifications sometimes named. They are treated as varieties because the critical differentiae are not stable; where two overlap large numbers of intermediates occur, and in areas where only one occurs aberrant individuals are apt to occur possessing one or other feature of another variety. They are grouped under two subspecies. The only British variety is ssp. *typicum* var. *typicum* R. M. Tryon, jr., and belongs to a group of varieties which have the fertile and sterile indusium ciliate, or pubescent, or both; ultimate segments densely to sparsely pubescent beneath between the margin and midrib; pinnules nearly at right angles to the costa, and other characters. The var. *latiusculum* (Desv.) Underwood ex Heller, recorded for Scandinavia (a relic?) and a few other localities in Europe, though mainly Eastern

North American, belongs to another set with fertile and sterile indusium glabrous, ultimate segments glabrous beneath between the margin and the midrib, or slightly pubescent on part of the segment; pinnules at an oblique angle to the costa. No other varieties occur in Europe.—[Wi.]

WEEDS in 1942. Major McClintock reports that weeds which on account of the war had to be left, mainly in beds of shrubs, at Withyham, Sussex, grew to the following " prodigious heights ":—*Rubi* to over 13 ft. 2 in.; *Angelica sylvestris* L., 6 ft. 9 in.; *Heracleum Sphondylium* L., 8 ft. 7 in. and 9 ft. 10 in. on one plant; *Cirsium lanceolatum* (L.) Scop., three stems on one plant from 5 ft. 8 in. to 5 ft. 10 in.; *C. arvense* (L.) Scop., half grown at 6 ft. 2 in.; *Urtica dioica* L., to 8 ft. 4 in. (several over 8 ft.); *Holcus lanatus* L., 3 ft. 9 in.

PLANT RECORDS.

* = New vice-county record: when it precedes the *B.P.L.* number it refers only to the first record. [*] preceding *B.P.L.* number indicates that the paragraph includes a new vice-county record. † = Not native in this locality: when it precedes the *B.P.L.* number it applies to all the records.

Note.—In the case of direct contributions, the name of the contributor is printed in small capitals. In the case of records which are Abstracts, the reference is indicated in brackets, either in full or by a date referring to the Bibliography.

Note to Contributors.—For many years past, records sent in have been transcribed on to cards measuring 5 × 3 inches, in which form they are examined by all members of the Editorial Sub-Committee and then prepared for press. If those who contribute to Plant Records would send them in on 5 × 3 cards or stout paper slips (each record, or at least each vice-county's records for each species, on a separate slip) the preparation of the Records for examination and printing would be a simple matter, whereas at present it involves a very considerable number of hours of work. For those who will help in this way, the form used is:—

Top line, *B.P.L.* number and name of species, the number preceded by * if N.C.R. and by † if not native in the locality.	405/13d. *Centaurea Scabiosa* L.
Second line: name or variety or subspecies, followed on the next lines by any other subdivisions.	Var. *succisifolia* E. S. Marshall.
Following lines: number of v.-c., comma, name of vice-county (abbreviated), semicolon, habitat and locality of record, year (and reference number if any), name of discoverer followed (if different) by "comm." (i.e. communicavit: sent in by) and the name of the sender, followed by the name and any remarks of the person who made the determination, if different.	41, Glam.: cliffs at Lavernoch Point, 1939, E. Vachell, det. C. E. Britton, who writes ". . . . . ."
	(In the bottom left-hand corner add in pencil, if known, the details of the date, e.g. 15/8/39 if 15 Aug. 1939, and in the centre of the base of the slip, also in pencil, the whereabouts of any dried specimen, e.g., "Herb. Vachell," "Herb. Mus. Brit.", and "Hb. Kew." etc. (i.e. add in pencil the information not to be printed but useful for the future use of Editors.

1/1. Clematis Vitalba L. 57, Derbyshire; still on an old wall at Matlock, 1942, D. McClintock.

1/1b. CLEMATIS VITALBA L. var. INTEGRATA DC. 48, Merioneth; Penmaenpool Glen: Barmouth: Llanaber: Caerdeon: Pandy Glen: Llandderfel; 1941, J. A. WEBB [the var. *integrata* appears to be the common form in v.-c. 48], comm. NAT. MUS. WALES.

3/1. ANEMONE PULSATILLA L. [†7, N. Wilts.; has been planted on Devizes Golf Course, Welch and Grose (1942 : 71).]

4/1. ADONIS ANNUA L. emend. Mill. 8, S. Wilts.; "King Manor Hill, abundant in and around several fields and flowering in spring and autumn, according to the time of the year when the soil is disturbed," Welch and Grose (1942: 71).

*5/1. MYOSURUS MINIMUS L. 2, E. Cornwall; Bude, at least 1000 plants in a dryish lane with cart-ruts near Maer marsh, 1941, Dr J. H. DAVIE: first recorded in the *Annual Report of the Clifton College Scientific Society* for 1941, p. 13—also collected in 1942.

6/6. RANUNCULUS LINGUA L. 7, N. Wilts.; "near Chippenham, R. TANNER" (1938, still there 1941, J. D. GROSE), Welch and Grose (1942 : 72).

6/20. RANUNCULUS FLUITANS Lam. 7, N. Wilts.; near Stanley, also Hannington Bridge, 1941, J. D. GROSE, det. R. W. BUTCHER.

*6/30. RANUNCULUS LUTARIUS Bouvet. 46, Cardigan; pool between Aberporth and Mwnt, 1941, J. A. WHELLAN, comm. NAT. MUS. WALES.

6/32. RANUNCULUS HEDERACEUS L. 106, E. Ross; near Munlochy, Black Isle, 1942, Miss U. K. DUNCAN.

6/33e. RANUNCULUS FICARIA L. var. BULBIFERA Marsden-Jones. 20, Herts.; Moor Park, Rickmansworth, 1942: 24, Bucks.; Chenies, 1942: 37, Worcester; Alfrick, Hill End Farm, Longdon, Guarlford, 1941; F. M. DAY.

7/1d. CALTHA PALUSTRIS L. var. MINOR (Mill.) DC. 5, S. Somerset; Aldermans Barrow, C. J. Bartlett (1940: *Proc. Somerset Arch. and N.H.Soc.*, 1939, lxxxv, 234).

9/2. HELLEBORUS FOETIDUS L. 12, N. Hants; in chalk pit and hazel coppice above it, Greywell, 1941, Miss T. COLE, comm. N. E. G. CRUTTWELL.

11/1. AQUILEGIA VULGARIS L. 35, Monm.; near Hadnock Quarries, Monmouth, 1942, R. LEWIS.

†13/3. DELPHINIUM GAYANUM Wilmott. 24, Bucks.; in a cornfield near Medmenham, 1941, J. E. LOUSLEY.

*14/1. ACONITUM ANGLICUM Stapf. 42, Brecon.; roadside, Bwlch, 1942, S. G. CHARLES, comm. NAT. MUS. WALES.

†17/3. BERBERIS ARISTATA DC. 5, S. Somerset; this still occurs in the well-trimmed hedge in the lane at Bossington whence it was first recorded by Marshall (*Suppl. Fl. Somerset*, 9, 1914; *Journ. Bot.*, 393, 1907; *ibid*, 74, 1909; *B.E.C. 1908 Rep.*, 358, 1909; *Watson B.E.C.*, 1908/9 *Rep.*, 173, 1909), but it is also to be seen in many other hedges about Bossington and Allerford. There can be little doubt that it has been deliberately planted. June 15th, 1942. J. E. LOUSLEY.

†21/1b. PAPAVER SOMNIFERUM L. var. HISPIDUM H. C. Watson. 17, Surrey; during 1941 this occurred in many places about Headley, Box Hill and Fetcham, in far greater quantity than I have previously noticed it—the increase is almost certainly attributable to the greater acreage under the plough owing to the war: 23, Oxon.; near Chazey Wood, Mapledurham, 1941; the species was recorded from here in 1833, and is still plentiful in the field where I found it in 1923, J. E. LOUSLEY.

21/2e. PAPAVER RHOEAS L. var. CHELIDONIOIDES O. Kze. 8, S. Wilts.; Larkhill, 1939, R. C. L. Burges (Grose, 1940, 332).

†27/1. ARGEMONE MEXICANA L. 7, N. Wilts.; fallow field, Spirthill, 1942, J. D. GROSE, det. and comm. J. E. LOUSLEY.

†28/1. ESCHSCHOLTZIA CALIFORNICA Cham. sensu lato sec. Jepson. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE, det. J. P. M. BRENAN.

31/1. CORYDALIS CLAVICULATA (L.) DC. 57, Derbs.; Shirley Park, Sydnope Stand, and Farley Moor, at the latter still in flower in January on an exposed cliff face at 850 ft., after days of frost and snow, 1942, D. McCLINTOCK.

†31/4. CORYDALIS LUTEA (L.) DC. 48, Merioneth; Arthog, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

*32/4. FUMARIA PURPUREA Pugsl. 76, Renfrew; allotments at Merrylee, Glasgow, July 1942, R. MACKECHNIE.

32/5. FUMARIA BORAEI Jord. 16, W. Kent; near Hook Green, J. R. WALLIS.

*33/1. MATTHIOLA INCANA (L.) R. Br. 66, Durham; rocky inaccessible cliff, Sunderland, 1851, E. C. ROBSON (as *M. sinuata*: in Herb. H. T. Mennell), comm. A. J. WILMOTT—requires investigation: the correctness of the habitat in spite of wrong identification suggests that the locality given may be correct, A. J. W.—add to *C.F.* in brackets.

†35/5. Rorippa austriaca (Crantz) Bess. 21, Middlesex; several large patches for a distance of half-a-mile on waste ground by the Thames at Chiswick, 1941, N. D. Simpson and N. Y. Sandwith.

*36/2. Barbarea verna (L.) Asch. 46, Cardigan; Newcastle Emlyn and Llandyssil, 1941, J. A. Whellan, comm. Nat. Mus. Wales.

39/7. Cardamine bulbifera (L.) Crantz. 14, E. Sussex; wood near Hook Green: 16, W. Kent; near Hoathly, Lamberhurst, J. R. Wallis.

*44/3. Erophila praecox (Stev.) DC. 45, Pembroke; Nevern, 1941, J. A. Whellan, comm. Nat. Mus. Wales.

45/4. Cochlearia micacea E. S. Marshall. 104, N. Ebudes; Fionchra and Ruinsival, Rhum, Harrison *et al.* (1941A), as *C. arctica* Schlecht.

†47/2. Hesperis matronalis L. 36, Hereford; Birchwood, Cradley, 1939, F. M. Day.

†49/3. Sisymbrium altissimum L. 20, Herts.; roadside near Sandy Lodge, Rickmansworth, 1941, F. M. Day. 57, Derbs.; all round Derby, 1942, D. McClintock.

*†49/5. Sisymbrium Irio L. 54, N. Lincs.; waste ground, Grimsby, 1941, Miss E. F. Noel, comm. A. J. Wilmott.

49/6. Sisymbrium officinale (L.) Scop. var. leiocarpum DC. 29, Cambs.; ploughed field, Fulbourn, 1939: 39, Staffs.; Penn, Wolverhampton, 1941; F. M. Day.

50/1. Erysimum cheiranthoides L. 57, Derbs.; Breadsall, also Matlock, 1942, D. McClintock.

†50/7. Erysimum repandum L. 14, E. Sussex; appeared in a freshly sown lea at Lye Green, 1942, D. McClintock.

†54/21. Brassica Erucastrum L. 17, Surrey; gravel pit near Mitcham Junction Station, 1941, J. E. Lousley.

55/2. Diplotaxis muralis (L.) DC. 55, Leics.; Hinckley, 1942, F. A. Sowter. 57, Derbs.; in plenty at Matlock and Matlock Bath, 1942, D. McClintock.

†61/3. Lepidium Draba L. 20, Herts.; cornfields, Rickmansworth, 1941, F. M. Day. 57, Derbs.; railway bank, Gt. Longstone Station, 1942, D. McClintock.

†61/3c. Lepidium Draba L. var. viridescens Druce. 56, Notts.; Nottingham, 1936, R. Bulley, det. and comm. C. E. Britton.

[*]†61/4. LEPIDIUM RUDERALE L. 17, Surrey; grounds of Orphanage, Beddington, 1942, J. E. LOUSLEY. 55, Leics.; colonising the cleared sites in Leicester, 1942, F. A. SOWTER. *57, Derbs.; rubbish heap north of Derby, 1942, D. MCCLINTOCK.

†61/24. LEPIDIUM NEGLECTUM Thell. 11, S. Hampshire; waste ground, Christchurch, 1921, A. W. GRAVESON, comm. J. E. LOUSLEY.

64/1. THLASPI ARVENSE L. 53, S. Lincs.; among peas near Grantham, (last year's crop wheat), 1942, J. M. MELTHAM, comm. A. J. WILMOTT.

64/4. THLASPI CALAMINARE Lej. & Court. 57, Derbs.; covers a wide area which includes at least Matlock, Masson Lees, Masson Hill, Heights of Abraham, High Tor (two very distinct stations), Starkholmes and Ball Eye, by Cromford—from 400 ft. to 1000 ft.: a few plants had second blooms in August; 1942, D. MCCLINTOCK.

*65/1. IBERIS AMARA L. 7, N. Wilts.; near Lammy Down, also abundant in chalk fields on Bishopstone Downs, 1941, J. D. Grose (Welch and Grose; 1942, 72).

66/1. TEESDALIA NUDICAULIS (L.) R. Br. 56, Nottingham; sand quarry between Worksop and Blyth, 1941, Percy Biggin (1941: *N.W. Nat.*, xvi, 206).

†70/1. VOGELIA PANICULATA (L.) Hornem. 17, Surrey; Warlingham, 1941: Sanderstead, 1942, C. E. BRITTON.

†74/2. BUNIAS ORIENTALIS L. 15, E. Kent; well established in cultivated fields and waste places about Forstal, Aylesford, 1939: 17, Surrey; a few plants in a hedgebank near Nohome Farm, Epsom Downs, 1941: abundant in a neglected chalky field near Court Wood, Selsdon, 1941: river bank by the island at Sunbury Lock, 1942—as this plant is recorded from here on the authority of Lt.-Col. A. H. Wolley-Dod in Salmon's *Fl. Surrey*, 1931, and I gathered it in 1930 when it occurred in greater quantity than at present, it appears to be persistent at this station, J. E. LOUSLEY. 33, E. Glos.; Bourton-on-the-Water, 1941, D. MCCLINTOCK.

†76/2. RAPISTRUM ORIENTALE Crantz. 17, Surrey; plentiful on waste ground, Warlingham, 1942, C. E. BRITTON.

†85/3. RESEDA LUTEOLA L. 14, E. Sussex; roadside near Mark Cross, introduced with road materials, J. R. WALLIS.

[*]88/3. VIOLA REICHENBACHIANA Jord. ex Bor. 39, Staffs.; shady part of a field overlooking Maer Hall, Maer, 1942, E. S. EDEES. *45, Pembroke; near Llechryd, 1941, J. A. WHELLAN, comm. NAT. MUS.

WALES. 106, E. Ross; in rocky woods near Kilmuir, 1942, Miss U. K. DUNCAN.

88/4. VIOLA RIVINIANA Rchb. flore albo. 3, S. Devon; Scabbacombe Head, Brixham, 1939 F. M. DAY.

88/4. VIOLA RIVINIANA Rchb. f. ROSEA Neum. Wahlst. & Murb. 3, S. Devon; Berry Pomeroy, 1941, E. M. PHILLIPS.

88/46. VIOLA RIVINIANA Rchb. var. DIVERSA Greg. 37, Worcester; Old Hills, Powick; Worcestershire Beacon, West Malvern, 1941, F. M. DAY.

88/6b. VIOLA CANINA L. var. ERICETORUM Rchb. 16, W. Kent; near Scotney Castle, Lamberhurst: Bayham, 1942, J. R. WALLIS.

88/7. VIOLA LACTEA Sm. 3, S. Devon; Ivybridge, 1941, E. M. PHILLIPS.

88/7×4. VIOLA LACTEA Sm. × RIVINIANA Rchb. 2, E. Cornwall; St Cleer Downs, 1941, E. M. PHILLIPS.

88/8h. VIOLA ODORATA L. var. SUBCARNEA (Jord.) Parlat. 3, S. Devon; near Mansands, Brixham, 1941: 17, Surrey; near Guildford, 1941: 36, Hereford; Chances Pitch, Colwall, 1939, F. M. DAY.

88/9b. VIOLA HIRTA L. var. FOUDRASI (Jord.) Rouy. & Fouc. 37, Worcester; Croft Bank, West Malvern, 1941, F. M. DAY.

88/9i. VIOLA HIRTA L. var. PROPERA (Jord.) Gillot. 3, S. Devon; Ingsden Wood, Ilsington, 1940: 37, Worcester; Croft Bank, West Malvern, 1941, F. M. DAY.

88/15. VIOLA VARIATA Jord. 24, Bucks.; Great Missenden, 1942, F. M. DAY.

88/20. VIOLA LLOYDII Jord. 16, W. Kent; Crockham Hill, 1939, A. BEADELL, det. and comm. C. E. BRITTON.

88/28. VIOLA DESEGLISEI Jord. f. SUBTILIS (Jord.) Drabble. 39, Staffs.; cultivated field, Eccleshall, 1942, E. S. EDEES [det. Mrs E. DRABBLE].

*89/2. POLYGALA VULGARIS L. 44, Carmarthen; Llanedy, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

89/4. POLYGALA OXYPTERA Rchb. s. l. 4, N. Devon; pasture, Landrake, Cove near Tiverton, 1942, A. L. STILL, det. A. J. WILMOTT, comm. E. C. WALLACE and J. E. LOUSLEY.

92/2. DIANTHUS DELTOIDES L. 12, N. Hants.; gravel pit at Newtown, 1942, H. WHEELER, comm. A. J. WILMOTT. 17, Surrey; a few patches in a chalky field, and two clumps on a sandy roadside about half mile away, between Chipstead and Kingswood, 1941—the first locality was recorded in Salmon's *Flora of Surrey* on the authority of L. G. Payne, and the plant must have persisted there for at least ten years: it is possible that it has been deliberately introduced in both localities by a misguided enthusiast, J. E. LOUSLEY.

96/1. SILENE MARITIMA With. 57, Derbs.; casual or escape at Little Eaton, 1942, D. MCCLINTOCK.

96/10. SILENE NUTANS L. 64, Mid West Yorks.; still on rocks at Knaresborough, 1942, E. C. WALLACE.

98/9. LYCHNIS GITHAGO (L.) Scop. 23, Oxon.; oatfield near Badgemoor House, Henley-on-Thames, 1941, J. E. LOUSLEY.

101/2. STELLARIA NEMORUM L. 35, Monm.; banks of Wye near Hadnock, Monmouth, 1942, R. LEWIS.

*101/4b. STELLARIA NEGLECTA Weihe var. ELIZABETHAE (F. Schultz). 46, Cardigan; Cenarth, and near Aberporth, 1941, J. A. WHELLAN, comm. NAT. MUS. WALES.

102/3. ARENARIA NORVEGICA Gunn. 104, N. Ebudes; extensions of range on Rhum are noted by Harrison *et al.* (1941A); the degree of ciliation is stated to be variable.

102/6b. ARENARIA LEPTOCLADOS Guss. var. VISCIDULA Rouy & Fouc. 17, Surrey; Chelsham, 1936, A. BEADELL, det. and comm. C. E. BRITTON.

102/8. ARENARIA TENUIFOLIA L. 34, W. Glos.; waste heap, Old Forge, between Whitecroft and Lydney, 1942, R. LEWIS. 41, Glam.; St Fagans Castle Grounds, in several places, 1942, Miss E. VACHELL. 63, South-west York; Lindrick Common, John Brown (1941: *N.W. Nat.*, xvi, 332).

*103/3. SAGINA INTERMEDIA Fengl in Ledeb. 94, Banff; at 3050 ft. on N. side of Beinn a Bhuird, J. Grant Roger (J. R. Matthews, 1942: *J.B.*, lxxix, 208).

104/1. SPERGULA ARVENSIS L. emend. Rchb. 69, Westmorland; cult. land near Dungeon Ghyll, 1941; not recorded in Wilson's *Flora of Westmorland* where it is stated that *S. sativa* is the usual plant, but see *Journ. Bot.*, xliv, 171, 1906, E.; C. WALLACE.

†108/1. CLAYTONIA ALSINOIDES Sims. 3, S. Devon; Haytor Vale, 1942, Miss R. DAVENPORT, comm. A. J. WILMOTT. 17, Surrey; over about

one acre of woodland at Abinger, 1937: Sanderstead, 1941, C. E. Britton. 69b, Lake Lancashire; lanes near Skelwith, 1942, E. C. Wallace.

112/12. Hypericum dubium Leers. 95, Elgin; Forres, 1942: 96, Easterness; near Beauly, 1942, Miss U. K. Duncan.

112/14×12. ×H. Desetangsii Lamotte (*H. dubium* Leers × *perforatum* L.). 16, W. Kent; Dunton Green, 1942, A. Beadell, det. and comm. C. E. Britton.

†116/8. Lavatera trimestris L. 18, S. Essex; waste ground, Dagenham, H. K. Airy-Shaw.

123/1. Tilia platyphyllos Scop. 40, Shropshire; near the Woodhouse Farm, Wyke: near the top of Benthal Edge: near Bridgnorth Golf Links: Tickwood: Willey: Aldenham; George Potts (1940: *N.W. Nat.*, xv, 262-3). Apparently native in v.-c. 40, remove square brackets in the *Comital Flora.* 63, S.W. Yorks.; Anston Stones Wood, 1942. The habitat—a rocky wood on the magnesian limestone—is almost identical with that not many miles south over the Derbyshire border, where it has been regarded as indigenous. It still occurs (*fide* C. M. Rob) at Richmond (65), the only Yorkshire locality in which it has been regarded as having any claims to be considered native, W. A. Sledge.

123/3. Tilia cordata Mill. 63, S.W. Yorks.; Anston Stones Wood, 1942, indigenous here in my opinion, W. A. Sledge.

124/1. Radiola Linoides Roth. 106, E. Ross; near Munlochy, Black Isle, 1942, Miss U. K. Duncan.

†125/4. Linum usitatissimum L. 57, Derbs.; still at Breadsall (see W. R. Linton, *Fl. Derbysh.*): also Litton Eaton and the outskirts of Derby, along the main road, never thickly, but looking well established; 1942, D. McClintock.

127/1. Geranium sanguineum L. 34, W. Glos.; woods near Symonds Yat Station, 1941, R. Lewis.

†127/2. Geranium versicolor L. 55, Leicester; roadside near Swithland Wood, 1942, F. A. Sowter.

127/11. Geranium rotundifolium L. 17, Surrey; railway station, Cheam, 1941, J. R. Wallis.

128/2. Erodium moschatum (Burm.) L'Hérit. 34, W. Glos.; a single plant near Brown's End, Bromsberrow, 1942, F. M. Day.

*†132/3. Oxalis stricta L. 35, Monmouth; garden weed, Monmouth, 1940, R. Lewis.

†133/3. IMPATIENS PARVIFLORA DC. 21, Middx.; on the R.A.F. Station, Uxbridge, 1941, D. McCLINTOCK. 24, Bucks.; Caversham, 1941, D. McCLINTOCK. 29, Cambs.; Portugal Street, Cambridge, 1939: 37, Worcs.; near Church, Powick, 1939, F. M. DAY. 57, Derbs.; abundant at many places along the road from Derby to Matlock, e.g., Derby: Darley Abbey: Allestree: Little Eaton: Duffield Bank: Belper: Cromford: Matlock Bath: Matlock; 1942. D. McCLINTOCK.

†133/4. IMPATIENS ROYLEI Walp. 16, W. Kent; between Little Cheveney and Marden Beech, 1942, J. R. WALLIS. 36, Heref.; banks of the Wye between Bibbings Farm and Symonds Yat, 1942, R. LEWIS. 39, Staffs.; abundant on both banks of the Lyme brook, Newcastle, 1942, E. S. EDEES (No. 2396).

†145/4. LUPINUS ANGUSTIFOLIUS L. 17, Surrey; growing with vetches at Chelsham, 1942, A. BEADELL, det. and comm. C. E. BRITTON.

*149/3. ULEX MINOR Roth. 56, Nottingham; between Budby and Edwinstowe, John Brown (1941 : *N.W. Nat.*, xvi, 207), det. N. J. Sandwith.

†154/2. MELILOTUS ALBA Desr. 37, Worcs.; Upton-on-Severn, 1941 (*Trans. Worc. Nat. Club*, ix, 302).

†154/3. MELILOTUS ARVENSIS Wallr. 17, Surrey; Deepcut, Frimley, 1941, D. McCLINTOCK.

*†154/4. MELILOTUS INDICA (L.) All. 82, E. Lothian; waste ground in disused garden, St Germains, 1942, Mrs A. STEWART-SANDEMAN, comm. A. J. WILMOTT.

155/7. TRIFOLIUM ARVENSE L. 34, W. Glos.; waste heap, Old Forge, between Whitecroft and Lydney, 1942, R. LEWIS.

155/20. TRIFOLIUM CAMPESTRE Schreb. 30, Beds.; downs between Dunstable and Whipsnade, 1942, A. J. WILMOTT.

160/6. LOTUS TENUIS W. & K. 17, Surrey; side of farm track near Ockley, 1941, E. C. WALLACE.

166/1. ASTRAGALUS GLYCYPHYLLOS L. 34, W. Glos.; top of Wet Arch, Upper Redbrook, near Newland, 1942, R. LEWIS.

166/3. ASTRAGALUS DANICUS Retz. 33, E. Glos.; Foxcote, 1942, Miss L. ABELL.

†170/1. CORONILLA VARIA L. 11, S. Hants.; a large patch flowering in railway cutting, Shawford, 1941, N. E. G. CRUTTWELL. 63, South-west York; by the railway line, Oughtibridge, 1941, Percy Biggin (1941: *N.W. Nat.*, xvi, 206).

†176/2. Vicia tenuifolia Roth. 17, Surrey; waste ground, Ham Pits, 1942, N. Y. Sandwith.

†176/5. Vicia villosa Roth. 26, W. Suffolk; on effluent from sugar beet factory, Bury St Edmund's, 1938, J. E. Lousley.

†176/6. Vicia dasycarpa Tenore. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. Lousley and E. C. Wallace, det. J. P. M. Brenan.

*†178/1. Lathyrus latifolius L. 45, Pembroke; Tenby, 1942, Mrs F. L. Rees, comm. Nat. Mus. Wales.

178/6b. Lathyrus pratensis L. var. villosus Schleich. 41, Glam.; near Wick, 1942, Miss E. Vachell.

*†178/7. Lathyrus hirsutus L. H.12—new to Ireland; in a barley field, 1942, Mrs E. Booth, comm. A. J. Wilmott.

†178/18. Lathyrus Cicera L. 63, S.W. Yorks.; Elland, 1905, B. B. Thompson, comm. A. J. Wilmott.

†178/20. Lathyrus hierosolymitanus Boiss. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. Lousley and E. C. Wallace, det. J. P. M. Brenan.

†183/9. Prunus serotina Ehrh. 17, Surrey; Frensham Common (an old tree), 1942, W. E. Farenden, det. and comm. A. B. Jackson.

184/12. Spiraea Filipendula L. 33, E. Glos.; Foxcote, 1942, Miss L. Abell.

185/27b. Rubus pistoris Bart. & Ridd. 39, Staffs.; hedgerow, Maer, 1942, E. S. Edees [det. F. Rilstone].

187/2×1. Geum rivale L. × urbanum L. 39, Staffs.; roadside between Warslow and Bottom House, Butterton, 1942, E. S. Edees.

*189/6. Potentilla verna L. 11, S. Hants.; between Great Yews and Round Clump, about 5 miles S.S.W. of Salisbury, 1941, B. Welch.

189/8. Potentilla procumbens Sibth. 39, Staffs.; roadside, Audley, 1942, E. S. Edees.

†189/11. Potentilla norvegica L. 69, Westmorland; stony roadside near Colwith, 1942, N. E. G. Cruttwell.

†189/13. Potentilla recta L. 21, Middx.; Teddington, 1905, B. B. Thompson, comm. A. J. Wilmott.

†189/18. Potentilla inclinata Vill. 16, W. Kent; gravelly bank at Swanley, 1942, F. R. Browning. 63, S.W. Yorks.; Elland, 1904, B. B. Thompson, comm. A. J. Wilmott.

190/1. Alchemilla minor Huds. (A. pubescens Lam.). 66, Durham; roadside ditch below Langdon Beck Hotel, "growing with *A. alpestris* Schm. and *A. pratensis* Schm. but distinct," 1923, A. J. Wilmott (No. 2000).

190/2. Alchemilla pratensis Schmidt. 24, Bucks; one patch on a grassy bank, Hampden Woods, Great Missenden, 1942, J. Bedford, comm. and det. A. J. Wilmott. 39, Staffs.; roadside, Upper Elkstone (No. 2509): roadside, Hollinsclough (No. 2502): Manifold Valley, Wetton (No. 2507); all 1942, E. S. Edees. H.36, Tyrone; road bank, Aghacolumb, Arboe, 1942, F. H. W. Kerr, comm. A. J. Wilmott. H.39, Antrim; "White Rocks" near Portrush, 1942, C. D. Chase.

[*]190/4. Alchemilla pseudominor Wilmott. 39, Staffs.; roadside near Clayton, Newcastle, 1942 (No. 2501), E. S. Edees—except in the folds and towards the margin the leaves are subglabrous above, but this variation is admitted in Lindberg's *Monograph* (p. 91), A. J. Wilmott. *H.36, Tyrone; roadside bank, Brookend, Arboe, 1942, F. H. W. Kerr, comm. A. J. Wilmott.

190/8. Alchemilla alpestris Schmidt. 39, Staffs.; Cotton (No. 2503): Blore and Swinscoe (No. 2504): Alstonfield (No. 2505): Manifold Valley, Wetton (No. 2622); all 1942, E. S. Edees—all these have petioles slightly pubescent with somewhat spreading hairs, A. J. Wilmott. *H.36, Tyrone; Dr Gillespie's rockery, and common in meadow beside Ballygawley, 1942, F. H. W. Kerr, comm. A. J. Wilmott.

191/2. Agrimonia odorata Mill. 7, N. Wilts.; Silk Wood, A. B. Jackson (Grose, 1940 : 334). 12, N. Hants; roadside near Bramley, 1942, N. E. G. Cruttwell. 24, Bucks.; wood near Hambleden, associated with *A. Eupatoria* L. var. *sepium* Breb., from which it could be distinguished not only by the fruits but also by the much larger, deeper yellow flowers, 1941, J. E. Lousley. 39, Stafford; Wetton; roadside between Wetton and Wettonmill, 1941, E. S Edees (*Trans. N. Staffs. Field Club*, 1941-42).

*†193/2. Poterium polygamum W. & K. 46, Cardigan; border of field, Nant y Ferwig, 1941, J. A. Whellan, comm. Nat. Mus. Wales.

193/4. Poterium officinale (L.) A. Gray. 2, E. Cornwall: near Tredinnick, Lanhydrock, 1941, E. M. Phillips.

194/2g. Rosa arvensis L. var. laevipes Gremli. 50, Denbigh; near Llanrhaiadr-yn-Mochnant, 1942, N. Y. Sandwith.

194/7. Rosa canina L. var. dumalis (Bechst.) Dum. 48, Merioneth; Caerdeon: Penmaenpool Glen, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/8e. Rosa canina L. var. verticillacantha (Mer.) Baker f. clivicola Rouy. 42, Brecon; Ciluni Valley, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/10g. Rosa dumetorum Thuill. var. calophylla Rouy. 35, Monmouth, St Mellons, 1941, A. E. Wade, det. E. B. Bishop. *48, Merioneth; near Pandyrodyn, with the flowering branches unarmed, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/10m. Rosa dumetorum Thuill. var. hemitricha (Rip.) W.-Dod. 48, Merioneth; Penhelig, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/12e(2). Rosa Afzeliana Fr. var. glaucophylla (Winch) W.-Dod. 48, Merioneth; Bala, with the leaflets smaller than normal, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/13b. Rosa coriifolia Fr. var. typica Chr. f. frutetorum (Bess.) W.-Dod. 42, Brecon; Ciluni Valley, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/13d. Rosa coriifolia Fr. var. Watsoni (Baker) W.-Dod. 48, Merioneth; Llanwchllyn, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/19d. Rosa tomentosa Sm. var. pseudo-cuspidata (Crép.) Rouy. 48, Merioneth; Ganllwyd, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

194/20e. Rosa Sherardi Davies var. typica W.-Dod. f. pseudomollis (Baker) W.-Dod. 42, Brecon; Ciluni Valley, 1941: 48, Merioneth; between Coed y Brenin and Trausfynydd Camp, 1941, J. A. Webb, det. E. B. Bishop, comm. Nat. Mus. Wales.

*†195/2. Pyrus communis L. 48, Merioneth; quarry, near Barmouth, 1941, J. A. Webb: Dolgelley, 1941, J. A. Webb, comm. Nat. Mus. Wales.

*196/2. Crataegus oxyacanthoides Thuill. 36, Hereford; one bush, Hanway's Coppice, Colwall, 1939: 37, Worcs.; The Narrow Hedges, Castle Morton Common, 1939, F. M. Day.

199/20. Saxifraga tridactylites L. 46, Cardigan; Towyn Warren, 1941, J. A. Whellan, comm. Nat. Mus. Wales. (Confirmation of record for v.-c. 46.)

†200/1. Tellima grandiflora (Pursh.) R. Br. 17, Surrey; damp copse near a house, Hambledon Heath, 1934, J. E. Lousley, det. J. P. M. Brenan.

203/1. Chrysosplenium alternifolium L. 34, W. Glos.; ditch at bottom of Wet Arch, Upper Redbrook, near Newland, 1942, R. Lewis.

*211/4. Sedum Forsterianum Sm. 35, Monm.; wall, between Hadnock Quarries and Symond's Yat, 1942, R. Lewis, det. A. J. Wilmott.

†212/1. Sempervivum tectorum L. 42, Brecon.; wall near Bwlch, 1942, S. G. Charles, comm. Nat. Mus. Wales.

214/1. Hippuris vulgaris L. 51, Flint; margin of a pond, near Mold, 1939, R. R. Broome ex A. A. Dallman (1940 : *N.W. Nat.*, xv, 71).

219/2. Lythrum Hyssopifolia L. 16, W. Kent; marshy area on bank of Medway near Aylesford, a single plant, 1941 (not found the following year), Cyril West. 29, Cambs.; damp hollow in field, by Chippenham Park Avenue, 1941, M. S. Campbell, T. Tutin and E. F. Warburg (rediscovered here in 1940 in the locality given in Babington's *Fl. Camb.*).

220. Epilobium L. Determined (or determinations confirmed) by G. M. Ash, unless otherwise stated.

220/3×5. Epilobium hirsutum L. × tetragonum L. em. Curt. 17, Surrey; near Fetcham Millpond, Leatherhead, 1941, J. E. Lousley.

220/6. Epilobium Lamyi F. Sch. 24, Bucks.; ride in Great Wood, Hambleden, 1942, J. E. Lousley.

*†220/7(2). Epilobium adenocaulon Hausskn. 8, S. Wilts.; Chute, 1941, Rev. W. L. Freer, comm. J. D. Grose. 17, Surrey; streamside, Itchingwood Common near Limpsfield, 1942, J. E. Lousley and J. R. Wallis. *19, N. Essex; Ugley Wood near Quendon, 1942, H. W. Pugsley and N. Y. Sandwith 30, Beds.; Deadmansea Wood, Whipsnade, 1942, A. J. Wilmott.

220/7(2)×10. Epilobium adenocaulon Hausskn. × montanum L. 8, S. Wilts.; Chute, 1941, Rev. W. L. Freer, comm. J. D. Grose.

220/8. Epilobium roseum Schreb. 39, Staffs.; canal side, Cheddleton, 1942, E. S. Edees. *51, Flint; Afonwen, 1942, J. A. Webb, comm. Nat. Mus. Wales.

220/9. Epilobium lanceolatum Seb. & Maur. 5, S. Somerset; Hopcott and Alcombe near Minehead, 1942—fairly plentiful in lanes in several places, and apparently new to district 2 of the *Flora of Somerset*, J. E. Lousley.

†220/17. Epilobium pedunculare A. Cunn. 3, S. Devon; near Melverton Station, 1941, Miss K. H. Johnstone, comm. E. M. Phillips (det. at Kew).

†223/6. OENOTHERA PUMILA L. (KNEIFFIA PUMILA (L.) Spach). 16, W. Kent; waste ground, Bidboro', Tonbridge, 1934, J. E. LOUSLEY, det. J. P. M. BRENAN.

247/5. APIUM INUNDATUM (L.) Rchb. fil. 57, Derbs.; pond-side at 1000 ft. at Minninglow, 1942, D. MCCLINTOCK.

*250/4. CARUM SEGETUM (L.) B. & H. 46, Cardigan; near Aberporth, 1941, J. A. WHELLAN, comm. NAT. MUS. WALES.

265/1. OENANTHE AQUATICA (L.) Poir. 36, Hereford; Holme Lacey, 1939, F. M. DAY. *47, Montgomery; pond in field on S. side of the Severn between Llandrinio and Crew Green, 1942, J. W. GOUGH and N. Y. SANDWITH.

†283/1. CAUCALIS LEPTOPHYLLA L. 39, Staffs.; brewery alien, Burton-on-Trent, 1938, R. C. L. BURGES, comm. J. E. LOUSLEY, conf. J. P. M. BRENAN.

†283/8. CAUCALIS LATIFOLIA L. 12, N. Hants; weed in chicken run, Winklebury, near Basingstoke, 1941, Mr BECKETT (poultry farmer), comm. N. E. G. CRUTTWELL.

†287/2b. SAMBUCUS NIGRA L. var. LACINIATA L. 41, Glamorgan; Brynau, near Blackpill, 1941, J. A. WEBB: 48, Merioneth; near Pennal, 1940, and Penybont ar Dyfi, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

287/2e. SAMBUCUS NIGRA L. var. VIRIDIS Ait. 33, E. Glos.; Foxcote, near Andoversford, 1942, the greenish-white berry has a sweet flavour and is very popular with birds, Miss L. ABELL. †35, Monmouth; garden hedge, The Kymin, Monmouth, 1942, Mrs and Miss LEWIS, comm. R. LEWIS.

†289/1. SYMPHORICARPUS RACEMOSUS Michx. 48, Merioneth; Llanbedr, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

296/6. GALIUM ULIGINOSUM L. 14, E. Sussex; Newbridge, 1942, J. R. WALLIS. 34, W. Glos.; The Quabs, Bromsberrow, 1940, F. M. DAY.

†298/5. ASPERULA ARVENSIS L. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE.

[*]304/4. VALERIANELLA CARINATA Lois. 7, N. Wilts.; Lydiard Millicent, Mrs Shepherd (Grose, 1940; 334). *20, Herts.; flint wall, Solesbridge Lane, east of Chorley Wood, 1942, W. JOHNSON, comm. C. E. BRITTON. *24, Bucks; in quantity on cultivated ground at Fingest, and on old walls between Fingest and Turville, C. E. Britton (1942: *J.B.*, lxxix, 193). 57, Derbys.; in Millers Dale and by the Monsal Head Hotel,

1942, D. McClintock; far from habitations in Monsal Dale, 1916, A. J. Wilmott.

306/2. Dipsacus pilosus L. 36, Heref.; wood edge near Wye between Bibbing's Farm and Symond's Yat, 1942, R. Lewis. 65, N.W. Yorks.; refound by Miss C. M. Rob at Whitcliffe Wood near Richmond, 1942—a splendid discovery which reinstates the species in North Yorkshire, W. A. Sledge.

328/3. Gnaphalium sylvaticum L. 57, Derbs.; Sydnope Stand and Stanton Woodhouse, 1942, D. McClintock.

341(2)/1. Siegesbeckia orientalis L. 59, S. Lancs; Rufford, twelve miles inland from its previously recorded locality at Freshfield, Hardy, E. (1940: *Nature*, cxlvi, 688).

†354/1. Galinsoga parviflora Cav. 23, Oxon.; Oxford, reported by Druce 30 years ago from waste ground in a nursery garden, has spread last year to the adjacent Merton St., and still further to Oriel College quadrangle, where the flower beds contained a number of specimens, 1942, J. W. Gough.

†354/2b. Galinsoga quadriradiata Ruiz. & Pav. var. hispida (DC.) Thell. 21, Middlesex; Hurlingham, 1941, Mrs Hepworth, comm. A. J. Wilmott.

†354/2b. Galinsoga quadriradiata Ruiz. & Pav. var. hispida (DC.) Thell. f. Vargasiana (Thell.) Mosseray. 21, Middlesex; Wilton Place, London, 1941, C. Vivian, det. N. Y. Sandwith.

†355/2. Madia sativa Molina. 9, Dorset; temporary ley near Beaminster, 1942, A. W. Graveson, teste J. P. M. Brenan, comm. J. E. Lousley. Attempts have been made to grow the plant in Europe for the sake of the oil which is extracted from the fruits, J. E. Lousley.

†355/3. Madia capitata Nutt. 8, S. Wilts.; West Lavington, 1942, B. W. H. Coulson, comm. A. J. Wilmott. 14, E. Sussex; ploughed up cricket field, Withyham, 1942, Major McClintock, comm. A. H. Wolley-Dod, det. A. J. Wlmott. 17, Surrey; by path through (unploughed) field between W. Horsley and Clandon, 1942, H. J. Burkill. All det. and comm. A. J. Wilmott.

†368/1. Anthemis tinctoria L. 57, Derby; near Cresswell, 1941, Percy Biggin (1941 : *N.W. Nat.*, xvi, 206).

†370/8. Chrysanthemum maximum DC. 51, Flint; Bagillt, 1942, J. A. Webb, comm. Nat. Mus. Wales.

†370/13c. Chrysanthemum Parthenium (L.) Bernh. var. breviradiatum (Schultes) Druce. 17, Surrey; Oxted, ligules very short, 1-2 mm. long, 1941, A. Beadell, det. and comm. C. E. Britton.

†371/7. MATRICARIA SUFFRUTICOSA (L.) Druce. 79, Selkirk; Gala shingle at Galashiels, 1939. Possibly persistent, but more probably a re-introduction, J. E. LOUSLEY, det. J. P. M. BRENAN.

378/1. ARTEMISIA ABSINTHIUM L. 36, Heref.; Bloody Furlong, Colwall, 1942, F. M. DAY.

[*]†380/2. PETASITES ALBUS (L.) Gaertn. 14, E. Sussex, and 16, W. Kent; both sides of the brook at Groombridge, 1942, D. MCCLINTOCK. *17, Surrey; roadside near Leith Hill Place, 1937, but found earlier by A. H. Carter, J. E. LOUSLEY; southern side of Leith Hill, 1941, E. C. WALLACE.

†380/3. PETASITES FRAGRANS Presl. 35, Monmouth; shady hedge bank, Mayhills, Monmouth, naturalised, 1942, R. LEWIS. 106, E. Ross; naturalised on the seashore at Rosemarkie (in flower 24th February), 1943, Miss U. K. DUNCAN.

†381/1. DORONICUM PARDALIANCHES L. 23, Oxon.; well established under a roadside hedge between Beckley and Elsfield, 1942, J. W. GOUGH. 57, Derbs.; escaped by the river at Matlock, 1942, D. MCCLINTOCK.

[*]†383/7. SENECIO SQUALIDUS L. 3, S. Devon; in quantity at North Road Station, Plymouth, and already spreading about the city on waste ground and bomb damage debris, 1941, E. M. PHILLIPS. 37, Worcester; roadside, Birlingham to Little Comberton, 1940, F. M. DAY. *48, Merioneth; Barmouth Junction, 1940, and Corwen, 1941, J. A. WEBB, comm. NAT. MUS. WALES. *57, Derby; tips of the Sheepbridge Iron Works, 1941, Percy Biggin (1941 : *N.W.Nat.*, xvi, 206).

383/8. SENECIO VISCOSUS L. 57, Derby; near Coal Aston, 1941: †63, South-west York; side of new road from Meadow Hall to Ecclesfield: neglected garden on a Sheffield housing estate, 1941; Percy Biggin (1941 : *N.W.Nat.*, xvi, 206).

†383/30. SENECIO TANGUTICUS Maxim. 22, Berks.; edge of R. Kennet, Newbury, 1942 (about 20 plants, looking well established, near a timber yard), H. WHEELER, det. and comm. A. J. WILMOTT.

383/32. SENECIO INTEGRIFOLIUS (L.) Clairv. 8, S. Wilts.; downs between Martin Wood and Tidpit, abundant, 1942, A. H. G. ALSTON.

†385/1. CALENDULA OFFICINALIS L. 51, Flint; Prestatyn sands, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

396/1. CIRSIUM ERIOPHORUM (L.) Scop. 37, Worcs.; Coneyburrow Hill, Longdon, 1942, F. M. DAY.

396/3. CIRSIUM HELENIOIDES (L.) Hill emend. Huds. 63, South-west York; Anston Stones, John Brown (1941 : *N.W.Nat.*, xvi, 332, as "*C. heterophyllum* Hill").

396/4. CIRSIUM ACAULE (L.) Weber ex Wigg. 12, N. Hampshire; clayey woodland glade, between Old Basing and Rotherwick, 1941, E. C. WALLACE.

396/4×6. CIRSIUM ACAULE (L.) Weber ex Wigg. × TUBEROSUM (L.) All. 8, S. Wilts.; Great Ridge (Grose, 1940 : 335).

396/4b. CIRSIUM ACAULE (L.) Weber ex Wigg. var. CAULESCENS (Pers.) DC. 17, Surrey; on exposed London clay on Mitcham Common, 1941, a large variant of the species with branched stems nearly 30 cms. tall bearing 5 to 6 capitula, J. E. LOUSLEY. 62, N.E. Yorks.; Partridge Hill, Goathland, Capt. W. S. Medlicott ex R. J. Flintoff (1940 : *N.W. Nat.*, xv, 263-5).

396/6. CIRSIUM TUBEROSUM (L.) All. 8, S. Wilts.; Great Ridge, Mrs J. D. Grose (Grose, 1940 : 334).

396/8×9. CIRSIUM ARVENSE (L.) Scop. × PALUSTRE (L.) Scop. 17, Surrey; Warlingham, 1942, C. E. BRITTON.

396/8f. CIRSIUM ARVENSE (L.) Scop. var. INCANUM (Fisch.) Ledeb. 6, N. Somerset; Dial Hill district, Clevedon, 1942, Miss K. Gregory, comm. A. J. WILMOTT. 23, Oxon.; beside the canal, Kidlington, appeared 1940 and spread both 1941 and 1942, Mrs E. F. EVETTS, det. A. J. WILMOTT.

396/9×5. CIRSIUM PALUSTRE (L.) Scop. × C. DISSECTUM (L.) Hill. 61, S.E. Yorks.; Skipwith Common, 1942, new to Yorkshire, W. A. SLEDGE.

†397/1. ONOPORDON ACANTHIUM L. 12, N. Hants; a fine patch on waste ground, Basingstoke, 1942, N. E. G. CRUTTWELL.

†397/3. ONOPORDON ILLYRICUM L. 64, Mid-W. Yorks.; a single specimen 6 ft. in height and with several large heads grew on cleared ground at Becca Hall, Aberford, 1942. Enquiry elicited the information that screenings from foreign barley had been previously spread over the ground, W. A. SLEDGE.

†399/1. SILYBUM MARIANUM (L.) Gaertn. 12, N. Hants; earth of an air-raid shelter, Basingstoke, 1942, Rev. H. E. U. BULL, comm. N. E. G. CRUTTWELL.

405/7. CENTAUREA PRATENSIS Thuill. 16, W. Kent; Trottescliffe, 1942. A. BEADELL, det. and comm. C. E. BRITTON.

405/8. CENTAUREA OBSCURA Jord. 96, Easterness; near Allanfearn, 1942, Miss U. K. DUNCAN, det. A. J. WILMOTT.

405/12. CENTAUREA CYANUS L. 14, E. Sussex; appeared in a lea sown at Lye Green, 1942, D. McCLINTOCK. 22, Berks.; cornfield near

Theale, 1923: 23, Oxon.; field of oats near Badgemoor House, Henley-on-Thames, 1941, J. E. LOUSLEY; field between Wheatley and Garsington, 1941, B. F. HASSALL. 29, Cambs.; wheatfield near Hammond's Eau, Sutton, 1938: 95, Moray; plentiful in cornfields about Muirhead, Kinloss, 1938—the cornflower occurs frequently in waste places and as single plants in places where it is an obvious introduction. It has become decidedly rare of recent years in its proper habitat, and it seems useful to publish the only occasions when I have seen it growing in cornfields in quantity. In Moray it occurred over a considerable area in masses similar to those familiar to botanists of past generations, J. E. LOUSLEY.

†407/3. CARTHAMUS TINCTORIUS L. 51, Flint; tips near Holywell, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

*410/1. ARNOSERIS MINIMA (L.) Schw. & Koerte. 64, Mid-West Yorks.; wheat field between Selby and Camblesforth, only one plant seen, 1942, W. A. SLEDGE.

411/1b. LAPSANA COMMUNIS L. var. PUBESCENS Koch. 17, Surrey; Warlingham, 1942, C. E. BRITTON.

*416/3. CREPIS BIENNIS L. 40, Shropshire; hayfield and roadside near Brodwell Junction Station, 1942, J. W. GOUGH and N. Y. SANDWITH.

†416/10. CREPIS TARAXACIFOLIA Thuill. 58, Cheshire; waste heaps of a disused colliery, Neston, 1941, H. E. Green (1941: *N.W.Nat.*, xvi, 203).

*†419/8. HIERACIUM BRUNNEO-CROCEUM Pugsl. 46, Cardigan; Blaenffos, 1941, J. A. WHELLAN, comm. NAT. MUS. WALES. *48, Merioneth; near Hengwrt and Corris, 1940, Llanycil, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

419/62. HIERACIUM PRAECOX Sch.-bip. 17, Surrey; on a roadside bank bordering a beech plantation, Chelsham, 1940, A. BEADELL, det. H. W. PUGSLEY, comm. C. E. BRITTON.

421/3. HYPOCHAERIS GLABRA L. 54, N. Lincs.; Laughton Common, John Brown (1941: *N.W.Nat.*, xvi, 332).

†425/2. LACTUCA SERRIOLA L. 3, S. Devon; waste ground near North Road Station, Plymouth, 1941, E. W. CLARKE, comm. E. M. PHILLIPS.

†425/6. LACTUCA ALPINA (L.) Hook. f. 96, Easterness; in rubble at a disused distillery, Nairn, 1939, Mrs A. STEWART SANDEMAN, det. A. J. WILMOTT; still there in 1942; Miss U. K. DUNCAN.

†428/1. TRAGOPOGON PORRIFOLIUS L. 12, N. Hants; waste ground, Basingstoke, 1942, N. E. G. CRUTTWELL.

433/1. WAHLENBERGIA HEDERACEA (L.) Rchb. 12, N. Hants; shady bog, Fleet, 1941, N. E. G. CRUTTWELL.

435/2. CAMPANULA LATIFOLIA L., *flore albo*. 37, Worcs.; Temple Guiting Wood, 1940, A. E. Jones (*Trans. Worc. Nat. Club*, ix, 285)—this wood contains some doubtfully native plants, J. E. LOUSLEY.

†435/7. CAMPANULA RAPUNCULUS L. 33, E. Glos.; garden weed near Blockley, 1941, D. MCCLINTOCK.

435/8. CAMPANULA PATULA L. 35, Monmouth; Priory Grove Wood, Monmouth, 1940 (found here since the wood was cut in 1936), R. LEWIS. 36, Hereford; Whitehouse Farm, Cradley, 1939, F. M. DAY.

†436/2. LEGOUSIA SPECULUM-VENERIS (L.) Fisch. 12, N. Hants; cornfield, Wootton-St-Lawrence, 1942, G. W. WILLIS, comm. N. E. G. CRUTTWELL, det. J. P. M. BRENAN.

439/1. OXYCOCCOS QUADRIPETALUS Gilib. 62, N.E. Yorks.; by Ellerbeck, 1942, H. B. WILLOUGHBY SMITH, comm. A. J. WILMOTT.

†443/1. GAULTHERIA SHALLON Pursh. 3, S. Devon; pinewood on Peak Hill, Sidmouth, 1942: 17, Surrey, pinewood, Farnham Common, 1941, E. C. WALLACE.

445/1. CALLUNA VULGARIS (L.) Hull. 33, E. Glos.; Foxcote, 1942, Miss L. ABELL.

458/4. ARMERIA MARITIMA Willd. Calyx hairy on and between its ribs. 95, Elgin; Culbin Sands, near Forres, 1942, Miss U. K. DUNCAN.

460/3. PRIMULA VERIS L. 92, S. Aberdeen; Craig Leek, Invercauld, 1941, R. MACKECHNIE.

460/4. PRIMULA FARINOSA L. 69, Westmorland; Loughrigg Fell, Ambleside, 1942, E. C. WALLACE.

467/2b. ANAGALLIS ARVENSIS L. var. CARNEA Schrank. 14, E. Sussex; near Lye Green, 1942, Mrs D. MCCLINTOCK, comm. D. MCCLINTOCK.

468/1. CENTUNCULUS MINIMUS L. 6, N. Somerset; plentiful on a damp track in the Stoke Lane Valley near Nettlebridge, 1941, C. I. and N. Y. SANDWITH. [Very rare in the Bristol area, and hitherto only recorded from Leigh Woods in v.-c. 6, and from Syston Common in v.-c. 34.] 14, E. Sussex; Broadwater Forest, 1942, J. R. WALLIS. 106, E. Ross; near Munlochy, Black Isle, growing, as so frequently the case, with *Radiola Linoides*, 1942, Miss U. K. DUNCAN.

469/1. SAMOLUS VALERANDI L. 37, Worcs.; wet coppice between Castle Morton and Hollybed Commons, 1939. F. M. DAY.

†473/2. VINCA MINOR L. 106, E. Ross; naturalised in woods near Rosemarkie, 1943 (in flower 24th February), Miss U. K. DUNCAN.

†474/2. BUDDLEIA DAVIDI Franchet. 41, Glamorgan; foot of a wall and in the crevices of the remains of the tiled floor of a bombed building, Cardiff, 1942, A. E. WADE. †51, Flint; Greenfield, near Holywell, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

477/1. BLACKSTONIA PERFOLIATA (L.) Huds. 14, E. Sussex; a single plant on a sandy bank near Bayham, 1942, J. R. WALLIS.

478/4. CENTAURIUM PULCHELLUM (Sw.) Druce. 12, N. Hants; chalky bank in old disused brickworks, Sherborne St John, 1941, N. E. G. CRUTTWELL.

480/4c. GENTIANA AMARELLA L. var. PALLIDA (Pugsl.) Wilmott. 17, Surrey; Warlingham, 1941, C. E. BRITTON (as *G. axillaris* var. *pallida*).

†488/1. PHACELIA CILIATA Benth. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE.

†490/2. OMPHALODES VERNA Moench. 33, E. Glos.; in two woods a mile apart near Blockley, 1941, D. MCCLINTOCK. 45, Pembroke; Ludchurch, near Narberth, 1942, Miss E. C. HOWELLS, comm. NAT. MUS. WALES. 69, Westmorland; East side of Windermere, south of Bowness, in fair quantity, Mary B. Pack and Arthur W. H. Pack (1941 : *N.W.Nat.*, xvi, 92).

497/1. SYMPHYTUM OFFICINALE L. 39, Staffs.; Balterley, 1942 (No. 2279), E. S. EDEES.

†499/1. TRACHYSTEMON ORIENTALE (L.) D. Don. 16, W. Kent; naturalised in woodland west of Maidstone, 1942, CYRIL WEST.

500/1. ANCHUSA SEMPERVIRENS L. 35, Monm.; roadside, Mayhill, Monmouth, 1941, R. LEWIS.

†502/4. NONNEA VENTRICOSA (Sibth. & Sm.) Griseb. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE.

505/1. MERTENSIA MARITIMA (L.) S. F. Gray. 60, West Lancs.; shingle near Carnforth, 1941, J. N. FRANKLAND.

506/2. MYOSOTIS BREVIFOLIA C. E. Salmon. 64, Mid-W. Yorks.; Force Gill, Whernside, 1942, W. A. SLEDGE. 65, N.W. Yorks.; Hanswell Moor, Swaledale, at 750 ft., and Calamine House, Yoredale, at 1200 ft., 1942, C. M. ROB.

507/1. LITHOSPERMUM OFFICINALE L. 3, S. Devon; Cofflete, Yealmpton, 1941, E. M. PHILLIPS.

513/1e. Convolvulus arvensis L. var. Stonestreetii Druce. 12, N. Hants; still flourishing and flowering well (both 1941 and 1942) where discovered by G. W. Willis in 1915, Basingstoke, N. E. G. Cruttwell.

515/2. Cuscuta europaea L. 7, N. Wilts.; Staverton, in great quantity, 1941, Mrs M. le F. Shepherd and C. D. Heginbothom independently, comm. J. D. Grose. 17, Surrey; this species, which is most erratic in quantity and even appearance from year to year, was exceptionally abundant in 1941 and 1942 in many of the well-known stations by the Mole and Thames: 21, Middlesex; Thames bank opposite Chertsey, 1942, J. E. Lousley.

†515/7. Cuscuta suaveolens Ser. 63, S.W. Yorks.; spontaneously on Thyme, Groundsel, Nettle, *Calendula* and *Spiraea* in Lister Park, Bradford, 1942, A. Malins Smith, comm. W. A. Sledge.

†517/14. Solanum sisymbriifolium Lam. 20, Herts.; in field of linseed, near Harpenden, 1942, H. F. Barnes, det. and comm. A. J. Wilmott.

†520/2. Lycium halimifolium Mill. 51, Flint; Pantasaph and Rhyl, 1942, J. A. Webb, comm. Nat. Mus. Wales.

521/1. Atropa Belladonna L. 35, Monm.; waste ground (? casual here), Staunton Road, Monmouth, 1941, R. Lewis.

†522/1. Datura Stramonium L. 17, Surrey; allotments, Walton-on-Thames, 1942, J. E. Lousley.

†522/1b. Datura Stramonium L. var. chalybea Koch. 12, N. Hants.; filled-in bomb crater, Basingstoke, 1941, plant five feet high with purple stems and lilac flowers, N. E. G. Cruttwell (as var. *Tatula* (L.)).

†522/3. Datura Metel L. 19, N. Essex; Hythe Quay, Colchester, 1938, J. E. Lousley, det. J. P. M. Brenan.

524/1. Hyoscyamus niger L. 37, Worcs.; very plentiful at the holes of the rabbit warren, Coneyburrow Hill, Longdon, 1942, F. M. Day.

†527/1. Verbascum phlomoides L. 45, Pembroke; Tenby, 1941, Mrs F. L. Rees, comm. Nat. Mus. Wales.

†527/4. Verbascum virgatum Stokes. 17, Surrey; plentiful in a derelict field on the N. Downs above Oxted, 1942, A. Beadell, comm. C. E. Britton. 34, W. Glos.; Ryton, Bromsberrow, 1940, F. M. Day.

527/7×3. Verbascum Lychnitis L. × Thapsus L. 16, W. Kent; Furze Bottom near Leaves Green, 1937, A. Beadell, comm. C. E. Britton.

[*]527/8. Verbascum nigrum L. 16, W. Kent; near Biggin Hill, 1942, a form with sulphur-coloured flowers, A. Beadell, comm. C. E. Britton. 24, Bucks.; seven or eight plants of the rare state with white corollas amongst large numbers of normal yellow-flowered plants in a clearing in Great Wood, Hambleden, 1941, J. E. Lousley. *†45, Pembroke; with white flowers at Tenby, 1941, Mrs F. L. Rees, comm. Nat. Mus. Wales.

527/8×3. Verbascum nigrum L. × Thapsus L. 17, Surrey; chalky slope above River Mole, Boxhill, 1942, two slightly different plants occurred, J. E. Lousley. 24, Bucks.; roadside in Hambleden village, 1941, J. E. Lousley.

†532/2. Linaria purpurea Mill. 51, Flint; walls, Gronant, 1942, J. A. Webb, comm. Nat. Mus. Wales.

*532/3. Linaria repens (L.) Mill. 51, Flint; Bagillt and Pantasaph, 1942, J. A. Webb, comm. Nat. Mus. Wales. †96, Easterness; naturalised on railway sidings at Daviot, near Inverness, 1942, Miss U. K. Duncan.

†532/26b. Linaria Cymbalaria (L.) Mill. var. pallidior (Rouy) Druce. 8, S. Wilts.; wall in Salisbury Cathedral Close (Welch and Grose, 1942. 75).

†537/2. Mimulus moschatus Dougl. 14, E. Sussex; near Bayham, 1942, J. R. Wallis: by a stream at Rowfant, 1942, A. Beadell, comm. C. E. Britton. 57, Derbs.; by the R. Wye near Haddon Hall and on Tansley Moor, 1940, D. McClintock.

[*]539/1. Limosella aquatica L. 12, N. Hants.; peaty cart-rut, Hook Common, 1942, N. E. G. Cruttwell. *33, E. Glos.; near the lock, R. Severn, Forthampton, 1939, F. M. Day.

†542/1. Erinus alpinus L. 12, N. Hants; naturalised all up the side of a house at Lasham, 1941, N. E. G. Cruttwell. 51, Flint; limestone wall near Holywell, 1942, J. A. Webb, comm. Nat. Mus. Wales.

543/6. Veronica scutellata L. 57, Derbs.; by a pond near Breadsall, 1942, the Misses Buxton, comm. D. McClintock.

†543/41. Veronica filiformis Smith. 17, Surrey; meadow by stream south of Ockley, 1942, N. Y. Sandwith and E. C. Wallace. 60, W. Lancs.; grassy wayside in lane near Gressingham, Lime Valley, 1942, J. N. Frankland.

[*]545/19(4). Euphrasia anglica Pugsl. 7, N. Wilts.; apparently widespread in Savernake Forest (Welch and Grose, 1942, 75). *8, S. Wilts.; near Blackslough, 1942, J. D. Grose, det. H. W. Pugsley. *47, Montgomery; open glade on lower wooded slopes of Breidden Hill, 1942, J. W. Gough and N. Y. Sandwith, confirmed by H. W. Pugsley.

†546/4. Bartsia viscosa L. 23, Oxon.; beside the canal, Kidlington (with *Cirsium arvense* var. *incanum*, q.v.), 1940, not there in 1941, Mrs Evetts.

[*]548/5(2). Rhinanthus calcareus Wilmott. 7, N. Wilts.; Arn Hill, Warminster (No. 4469): Ewin's Hill, Aldbourne (No. 4472): both 1942, J. D. Grose. *12, N. Hampshire; grassy down near Hawkley, 1941, E. C. Wallace.

549/2. Melampyrum arvense L. 7, N. Wilts.; cornfield near Manton and clover field near Aldbourne (Welch and Grose, 1942: 75—not recorded for the county since 1895, seeds possibly dormant since the fields were last cultivated).

550/10. Orobanche minor Sm. 17, Surrey; Wandsworth Common, 1942, J. E. Lousley.

551/1. Lathraea Squamaria L. 33, E. Glos.; near Blockley (on Laurel), 1941, D. McClintock. 37, Worcs.; east side of Raggedstone Hill, " growing on the roots of holly, a rather uncommon host for this species " (*Trans. Worc. Nat. Club*, ix, 293). 51, Flint; growing under a Cherry Laurel (*Prunus Lauro-Cerasus* L.) in a garden, Caengwole, Kate Philips (1940 : *N.W.Nat.*, xv, 262).

553/2. Pinguicula vulgaris L. 12, N. Hants; in fen, Mapledurwell, Mrs Scott, coll. 1941, and comm. N. E. G. Cruttwell.

558. Mentha. All mints recorded by F. M. Day were determined by A. L. Still.

558/1. Mentha rotundifolia (L.) Huds. 36, Hereford; near Boat Inn, Breinton Common, 1939 and 1942, F. M. Day.

[*]558/2. Mentha alopecuroides Hull. 7, N. Wilts.; Okus, Swindon, 1941, J. D. Grose—det. A. L. Still as × *M. niliaca* var. *alopecuroides* Hull. *51, Flint; near St Asaph, 1942, J. A. Webb, comm. Nat. Mus. Wales.

558/3. Mentha longifolia (L.) Huds. 3, S. Devon; Nethway, Brixham, 1942: 36, Hereford; Whitehouse Farm, Cradley, 1940: R. Wye, Hereford, 1939: F. M. Day.

†558/4. Mentha spicata Huds. 35, Monm.; railway bank between Monmouth and Hadnock, 1942, R. Lewis. 36, Heref.; garden at Downs School, Colwall, " somewhat hairy plants with hairy calyces, probably under Smith's var. β," 1942, F. M. Day.

558/6a. Mentha piperita L. var. officinalis Sole. 37, Worcs.; edge of Castle Morton Common, 1939, F. M. Day.

558/6d. MENTHA PIPERITA L. var. SUBCORDATA J. Fraser. 36, Heref.; Evendine Corner, Colwall, 1939; by R. Wye, Breinton, 1942: 37, Worcs.; near Pixham Ferry, Powick, 1940; F. M. DAY.

558/7c. MENTHA AQUATICA L. var. LOBELIANA Beck. 3, S. Devon; Cornworthy, 1942: 34, W. Glos.; The Quab, Bromsberrow, 1942, " near this variety ": 36, Hereford; Brock Hill Wood, 1941; Bloody Furlong, Colwall, 1940; Swinyard Hill, Eastnor, 1942: 37, Worcs.; Malvern Common, 1941; F. M. DAY.

558/7e. MENTHA AQUATICA L. var. MAJOR Sole. 34, W. Glos.; near Brown's End, Bromsberrow, 1942: 36, Hereford; Southend, Mathan, 1939: 37, Worcs.; Hanley Swan, 1939, F. M. DAY.

558/7h. MENTHA AQUATICA L. var. NICAEENSIS Briq. 3, S. Devon; Broadsands, Churston Ferrers: near Mansands, Brixham, 1941: 36, Hereford; Walls Hill, near Ledbury, 1940; F. M. DAY.

558/9. ×MENTHA VERTICILLATA L. 29, Cambs.; Wicken Fen, 1939, F. M. DAY. I gather from Mr H. Gilbert Carter and Dr Godwin, who were with me at the time, that this is the first record for the Fen.—F. M. DAY.

558/9q. ×MENTHA VERTICILLATA L. var. RIVALIS (Sole) Briq. 36, Hereford; White House Farm, Cradley, 1939: Canon Frome, 1940; F. M. DAY.

558/10. MENTHA GENTILIS L. 36, Hereford; R. Frome, Canon Frome, 1940; R. Wye, above Hereford, 1940: 37, Worcester; R. Teme, Cotheridge: R. Severn, Upton-on-Severn, 1940; F. M. DAY.

558/12. MENTHA RUBRA Huds. 3, S. Devon; bank of Otter below Otterton, 1942, E. C. WALLACE. 21, Middx.; Harefield. 1942: 36, Hereford; R. Wye, above Hereford, 1939; F. M. DAY.

558/13b. MENTHA ARVENSIS L. var. OBTUSIFOLIA Briq. 36, Heref.; Brock Hill, Colwall, 1942, F. M. DAY.

558/13d. MENTHA ARVENSIS L. var. AGRESTIS (Sole) Sm. 3, S. Devon; Southdown, Brixham, 1941: above Mudstone Bay, Brixham, 1942; F. M. DAY. 6, N. Somerset; in cultivated land on Mendip near Cranmore Tower, c. 950 ft., 1941, C. I. SANDWITH, conf. A. L. STILL. [This locality lies within the area where Sole found it. He wrote (in 1798): " This mint grows in cornfields about the Mendip Hills, Shepton Mallet and Frome; and in neglected gardens in that part of Somersetshire abundantly . . ."]. 37, Worcester; Cotheridge, 1940, F. M. DAY.

558/13e. MENTHA ARVENSIS L. var. AUSTRIACA (Jacq.) Briq. 36, Heref.; near the church and near Old Country House, Mathon, 1942, F. M. DAY.

558/13f. MENTHA ARVENSIS L. var. PRAECOX (Sole) Sm. 20, Herts.; Sarratt, "but too hairy to be typical," 1942: 36, Heref.; near the Seven Stars Inn, and near Old Country House, Cradley, 1942; F. M. DAY.

558/13g. MENTHA ARVENSIS L. var. ALLIONII (Bor.) Briq. 3, S. Devon; Lustleigh, 1939, F. M. DAY. ("Yes, calyx teeth short and broad, rather a small plant for *Allionii*; due perhaps to poor conditions."—A. L. S.).

558/13j. MENTHA ARVENSIS L. var. DENSIFOLIATA Briq. 36, Heref.; near the church, Mathon, 1942, F. M. DAY.

558/13m. MENTHA ARVENSIS L. var. BREVIDENS J. Fraser. 29, Cambs.; gravel pit, Cottenham, 1939, F. M. DAY. ("The nearest I can think of is var. *brevidens*, not too typical."—A. L. S.).

*561/10. THYMUS NEGLECTUS Ronn. 51, Flint; Milwr and Carmel, near Holywell, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

566/2. SALVIA HORMINOIDES Pourr. 37, Worcs.; Coneyburrow Hill, 1942, F. M. DAY.

569/1. NEPETA CATARIA L. 37, Worcs.; Longdon, 1942, F. M. DAY.

569/1b. NEPETA CATARIA L. var. SUBINCISA Asch. 49, Caernarvon; near Llandudno, 1941, Mrs DALLAS, comm. C. E. BRITTON.

577/4. STACHYS PALUSTRIS L. × SYLVATICA L. (×S. AMBIGUA Sm.). 36. Heref.; roadside between the church and Old Colwall, Colwall, 1942, F. M. DAY. 69, Westmorland. in small damp copse near Loughrigg Tarn, 1942, N. E. G. CRUTTWELL, confirmed by A. J. WILMOTT.

578/2. GALEOPSIS TETRAHIT L. 57, Derbs.; with pink, deep pink, cream, and white flowers near Minninglow, 1942, D. MCCLINTOCK.

†581/2. LAMIUM MACULATUM L. 51, Flint; Marian, near Newmarket, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

581/10. LAMIUM GALEOBDOLON (L.) Cr. forma PELORIA. 17, Surrey; in a sunken lane near Bletchingley, 1942, N. Y. SANDWITH, E. C. WALLACE, and Mrs B. WELCH; the form with peloric terminal flower which has been found in N. Somerset, Suffolk, and Bucks.

587/1b. AJUGA REPTANS L. var. ALBIFLORA Zersi. 41, Glam.; Kenfig Dunes, 1942, Miss E. VACHELL.

600/1. CHENOPODIUM RUBRUM L. 36, Heref.; Petty France, Colwall, 1942, F. M. DAY.

600/6. CHENOPODIUM MURALE L. 7, N. Wilts.; Spirthill, 1942, J. D. GROSE. 17, Surrey; grounds of orphanage, Beddington, 1942, J. E. LOUSLEY.

†600/8×24. CHENOPODIUM ALBUM L. × < BERLANDIERI Moq. subsp. ZSCHACKEI (Murr) Zobel var. TYPICUM (Ludw.) Aell. (C. VARIABILE Aell. var. MURRII Aell.). 17, Surrey; abundant and very uniform on debris from bombed houses dumped on Wimbledon Common, 1942, J. E. LOUSLEY, C. P. CASTELL, and W. H. SPREADBURY, det. J. P. M. BRENAN.

†600/8(2). CHENOPODIUM RETICULATUM Aell. 25, E. Suffolk; near Southwold, 1934, J. E. LOUSLEY, det. J. P. M. BRENAN.

†600/11b. CHENOPODIUM PRATERICOLA Rydb. var. THELLUNGIANUM Aell. (C. LEPTOPHYLLUM auct. non Nutt.). 20, Herts.; waste ground, Totteridge Lane, Barnet, 1929, J. E. LOUSLEY, det. J. P. M. BRENAN.

600/12. CHENOPODIUM FICIFOLIUM Sm. 29, Cambs.; arable field. Stow cum Quy, 1939, F. M. DAY.

600/13. CHENOPODIUM GLAUCUM L. 12, N. Hampshire; drained bed of Fleet Pond, 1941, E. C. WALLACE. 20, Herts.; farmyard near Allen's Green, Sawbridgeworth, 1941, H. W. PUGSLEY and E. C. WALLACE.

†600/21f. CHENOPODIUM HIRCINUM Schrad. subsp. EU-HIRCINUM Aell. var. TYPICUM Ludwig & Aellen, f. DEMINUTUM (Ludwig) Aell. 27, E. Norfolk; by old malt houses, Geldeston, 1934 (as *C. opulifolium* Schrad.). J. E. LOUSLEY and A. W. GRAVESON, det. J. P. M. BRENAN.

†606/11. ATRIPLEX TATARICA L. 25, E. Suffolk; Felixstowe Docks, 1938, J. E. LOUSLEY, det. J. P. M. BRENAN.

615/3. POLYGONUM BISTORTA L. 36, Hereford; Nupend, Cradley, 1940, F. M. DAY. 57, Derbs.; near Cromford and Parwich, 1942, D. McCLINTOCK.

*615/5b. POLYGONUM AMPHIBIUM L. var. TERRESTRE Leers. 48, Merioneth; Harlech, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

*615/15. POLYGONUM AEQUALE Lindm. 51, Flint; Point of Air, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

†615/31. POLYGONUM POLYSTACHYUM Wallich. 46, Cardigan; Tresaith, 1941, J. A. WHELLAN, comm. NAT. MUS. WALES. 48, Merioneth; near Llanelltyd and in profusion along Bala Lake near Llanycil, 1941, J. A. WEBB, comm. NAT. MUS. WALES. 49, Caernarvon; Bettws-y-coed, J. A. WEBB, 1942: 51, Flint; Holway, near Holywell, 1942; J. A. WEBB, comm. NAT. MUS. WALES.

†615/32. POLYGONUM SIEBOLDII De Vriese. 39, Staffs.; waste ground, Endon, 1942, E. S. EDEES [det. A. B. JACKSON].

†615/33. POLYGONUM SACHALINENSE Schmidt. 17, Surrey; Holmbury, St Mary, 1938, C. E. BRITTON. †48, Merioneth; Caerynwch, Brithdir, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

†616/1. FAGOPYRUM SAGITTATUM Gilib. 51, Flint; Bagillt, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

618/11. RUMEX PULCHER L. 3, S. Devon; Dittisham, 1942, F. M. DAY. Cliffs west of Branscombe, 1942, E. C. WALLACE. 21, Middx.; Batchworth Heath, Northwood, 1941, F. M. DAY.

618/13. RUMEX MARITIMUS L. 17, Surrey; Frensham Great Pond, 1941, E. C. WALLACE. Plentiful at Godstone Mill pond, which is about a mile from the station for this very rare Surrey plant where Mr E. C. Wallace showed it to me in 1934. At the latter place it was not to be found in 1942, J. E. LOUSLEY. 63, S.-W. Yorks.; Lake in Sandbeck Hall grounds, abundant, John Brown (1941 : *N.W.Nat.*, xvi, 207).

†618/17. RUMEX SCUTATUS L. 45, Pembroke; railway bank, Tenby, 1942, Mrs F. L. REES, comm. NAT. MUS. WALES.

*623/1. DAPHNE LAUREOLA L. 45, Pembroke; near Kilgetty. 1941, J. A. WHELLAN, comm. NAT. MUS. WALES.

623/2. DAPHNE MEZEREUM L. 33, E. Glos.; near Withington. 1942, Miss L. ABELL.

*†625/1. HIPPOPHAE RHAMNOIDES L. 42, Brecon; tip at Cwmfiedd, 1941, J. A. WEBB, comm. NAT. MUS. WALES.

†628/9. EUPHORBIA VIRGATA W. & K. 57, Derbs.; Little Eaton, 1942, D. MCCLINTOCK.

†628/11. EUPHORBIA CYPARISSIAS L. 11, S. Hants.: between Great Yews and Round Clump, about 5 miles S.W.W. of Salisbury, 1941, B. WELCH.

632/2. MERCURIALIS ANNUA L. 23, Oxon.: in a lane and adjacent gardens in Old Headington village, 1942. J. W. GOUGH. 55, Leics.; near Lutterworth, 1942, F. A. SOWTER.

633/1×4. ULMUS GLABRA Huds. × PLOTII Druce. 7, N. Wilts.; Blunsdon, Wolf Hall (Grose, 1940 : 336).

*633/2. ULMUS NITENS Moench. 40, Shropshire; Willey and below Benthall Edge opposite Iron Bridge (one tree), George Potts (1941 : *N.W.Nat.*, xvi, 331), det. A. Gepp.

*†633/3. ×ULMUS HOLLANDICA Mill. 48, Merioneth; Towyn and Mathafon, 1941, J. A. WEBB, comm. NAT. MUS. WALES. *51, Flint; Greenfield, near Holywell, 1942, J. A. WEBB, comm. NAT. MUS. WALES.

†635/1. Cannabis sativa L. 51, Flint; tips near Holywell, 1942, J. A. Webb, comm. Nat. Mus. Wales.

637/1b. Urtica dioica L. var. angustifolia Wimm. & Grab. 3, S. Devon; Dittisham, 1942: 37, Worcester; Drake's Broughton, 1939: St Ann's Well, Malvern, 1940; F. M. Day.

†639/1. Helxine Soleirolii Req. 51, Flint; Whitford, 1942, J. A. Webb, comm. Nat. Mus. Wales.

644/1. Carpinus Betulus L. 30, Beds.; hedge at edge of Old Hill Wood, Whipsnade, 1942 (? planted or not), A. J. Wilmott.

*646/2. Quercus petraea Lieblein. 7, N. Wilts.; Great Copse, Ludder Lane, Swindon, 1942, J. D. Grose (as *Q. sessiliflora*).

[*650/14. Salix Arbuscula L. 104, N. Ebudes; ravine N.W. of Fionchra, Rhum (Harrison *et al.*, 1941A).—[Not seen, Ed.]].

650/17. Salix Myrsinites L. 92, S. Aberdeen; in abundance and luxuriance on rocks and ledges, north side of Sgor Lochan Uaine, 1941, E. C. Wallace.

651/1. Populus canescens Sm. 16, W. Kent; Pearson's Green: near Bewl Bridge, Lamberhurst; 1942, J. R. Wallis.

651/2b. Populus tremula L. var. villosa (Lang) Syme. 16, W. Kent; Mount Pleasant, Lamberhurst, 1942, J. R. Wallis.

†651/2b. Populus candicans Ait. 23, Oxon.; by River Thames, Cuddeston, 1940, N. E. G. Cruttwell (as *P. Tacamahacca* Mill.).

652/1. Empetrum nigrum L 57, Derbs.; Matlock Moor and Farley Moor, 1942, D. McClintock.

653/1. Ceratophyllum submersum L. 37, Worcs.; pond near Farmer's Arms, Birt Street, Birt's Morton, 1939, F. M. Day.

653/2. Ceratophyllum demersum L. 36, Hereford; R. Wye, Hereford, 1939, F. M. Day.

667/3. Cephalanthera longifolia (Huds.) Fritsch. 12, N. Hants.; Herriard Park, 1942, N. E. G. Cruttwell.

668/1. Epipactis palustris (L.) Crantz. 7, N. Wilts.; on dry open down, Morgan's Hill (Grose, 1940 : 336).

668/2. Epipactis Helleborine (L.) Cr. em. Rend. & Britt. 57, Derbs.; four feet high with 49 flowers in the Via Gellia, 1942, D. McClintock (as *E. latifolia*).

668/3. Epipactis leptochila (Godf.) Godf. 23, Oxon.; beechwood near Maidensgrove Scrubs, Nettlebed, 1941: 24, Bucks.; Rassler Wood, near Marlow, 1941. On the Chilterns from Nettlebed and Bix to Hambleden and Marlow *E. leptochila* was observed in flower in many places at the end of July 1941. In this district it is much more common than *E. latifolia*, J. E. Lousley.

[*]669/8. Orchis praetermissa Druce. 16, W. Kent; Dunton Green, 1942, A. Beadell, comm. C. E. Britton. *63, S.W. Yorks.; marsh by river Torne near Auckley, 1942, W. A. Sledge.

*669/9. Orchis purpurella T. & T. A. Steph. 47, Montgomery; bog c. 1000 ft. on Boncyn Celyn, S.E. of Lake Vyrnwy, 1942, J. W. Gough and N. Y. Sandwith, confirmed by V. S. Summerhayes. *61, S.E. York.; Skipwith Common, 1942, W. A. Sledge. *H.36, Tyrone; marshy spot by Tonegan Bridge, Camowen River, near Carrickmore, 1942, F. H. W. Kerr, det. A. J. Wilmott.

*669/9b. Orchis purpurella T. & T. A. Stephenson var. pulchella (Druce) Pugsl. 75, Ayr; Drumboy near Fenwick, 1941, R. Mackechnie.

*669/11. Orchis Fuchsii Druce. 76, Renfrew; near Clarkston, 1941, R. Mackechnie.

669/11×9b. Orchis Fuchsii Druce × O. purpurella T. & T. A. Steph. var. pulchella (Druce) Pugsl. 75, Ayr; Drumboy near Fenwick, 1941, R. Mackechnie.

669/17. Anacamptis pyramidalis (L.) Rich. 54, N. Lincoln; sand dunes south of Skegness, 1942, E. C. Wallace.

674/4. Habenaria viridis (L.) R. Br. 33, E. Glos.; Foxcote, 1942, Miss L. Abell.

†676/3. Iris spuria L. 9, Dorset, naturalised over about ten acres of grassland, 1942, long known locally, C. R. Sylvester Bradley, comm. A. J. Wilmott.

*†680/1. Sisyrinchium angustifolium Mill. 86, Stirling; side of Loch Arklet, 1942, R. K. P. Miller, comm. A. J. Wilmott.

†686/2. Leucojum aestivum L. 96, Easterness; Drumnadrochit (streamside towards Milton: not noticed in gardens but *Narcissus poeticus* within 50 yards of the three plants seen), 1942, M. S. Campbell, comm. A. J. Wilmott.

702/8. Allium carinatum L. 37, Worcs.; Upton-on-Severn, 1941 (see *Trans. Worc. Nat. Club*, ix, 302—first noticed here by Miss Todd in 1924 and erroneously allocated by Dr Druce to Gloucestershire).

702/9. Allium oleraceum L. 37, Worcs.; lane near Bye Way Inn, Suckley, 1939, F. M. Day.

†706/4. Scilla hispanica Mill. 17, Surrey; Chelsham, 1939, growing with *S. non-scripta* (L.) Hoffm. & Lk. on the border of a wood, but presumably derived from a near-by cottage garden, C. E. Britton.

[*]707/2. Ornithogalum umbellatum L. 9, Dorset; Studland Heath, 1942, A. Dunston, comm. A. J. Wilmott. *†100, Clyde Isles; Keppel, Great Cumbrae Island, 1941, R. Mackechnie.

709/1. Fritillaria Meleagris L. 24, Bucks. (Ousel District); near Mentmore, J. E. Dandy (1942: *J.B.*, lxxx, 77).

714/1. Narthecium ossifragum (L.) Huds. 14, E. Sussex, Abbot's Down near Tunbridge Wells, a solitary specimen, 1942, J. R. Wallis.

718/7. Juncus filiformis L. 69, Westmorland; pasture by the Brathay below Elterwater, 1942, E. C. Wallace.

718/8. Juncus subnodulosus Schrank. 20, Herts.; meadows by the river south of Bishop's Stortford, 1941, H. W. Pugsley and E. C. Wallace.

[*]718/11. Juncus nodulosus Wahl. 65, N.-W. York.; Teesdale, removes the ? in *Comital Flora*, W. A. Sledge (1940 : *Naturalist*, 253). *69, Westmorland; Birkdale Pastures near the junction of the Tees and Maize Beck, W. A. Sledge (1940 : *Naturalist*, 253).

718/14. Juncus compressus Jacq. 7, N. Wilts.; near Lacock Mill, also Knighton, 1941, J. D. Grose. 12, N. Hampshire; marsh at North Warnborough, 1941, E. C. Wallace. 37, Worcs.; R. Severn, Upton-on-Severn, 1940, F. M. Day. 63, S.-W. Yorks.; meadow, South Wongs Farm, between Tickhill and Oldcoates, 1941, John Brown (1941: *N.W.Nat.*, xvi, 206).

†718/16. Juncus macer S. F. Gray. 12, N. Hants.; locally abundant on bare peaty and gravelly places, Hook Common, 1942, N. E. G. Cruttwell. 34, W. Glos.; wood clearing between Staunton and Coleford, 1941, R. Lewis.

719/2×3. Luzula Forsteri (Sm.) DC. ×L. pilosa (L.) Willd. 16, W. Kent, lane near Bayham; lane west of Lamberhurst, J. R. Wallis.

719/4. Luzula multiflora (Retz.) DC. 30, Beds.; Deadmansea Wood, Whipsnade, 1942, both v. *congesta* (Thuill.) Koch and the var. *typica* (Beck), with pedicellate heads, growing on the same root, as not infrequently observed by me. A. J. Wilmott.

722/1. Sparganium neglectum Beeby. 34, W. Glos.; The Quab and near Brown's End, Bromsberrow, 1942: 36, Hereford; Coddington, 1940: 37, Worcs.; Stoulton, 1939: Defford Common, 1940; F. M. Day.

722/2b. SPARGANIUM RAMOSUM Huds. var. MICROCARPUM Neum. 36, Hereford; R. Lugg, Lugwardine, 1940: R. Frome, Canon Frome, 1941; F. M. DAY.

729/1(2). ALISMA LANCEOLATUM With. 20, Herts.; canal, Cassiobury Park, Watford, 1941, F. M. DAY.

734/1. BUTOMUS UMBELLATUS L. 39, Staffs.; canal, Cheddleton, 1942, E. S. EDEES.

737/3. POTAMOGETON NODOSUS Poir. 23, Oxon.; in the River Thames nearly opposite Bolney Court, 2 miles S. of Henley-on-Thames, 1941. This species, formerly known to British botanists as *P. Drucei*, has been frequently collected from the River Loddon since it was discovered there by Dr Druce in 1893. I have seen it at intervals over about two miles of the course of the Loddon, and the discovery of the plant in the Thames near Cookham by the Rev. D. M. Heath encouraged search in that river nearer the confluence of the Loddon. *P. nodosus* was found in July 1941 to occur freely for about 1¼ miles, from a patch by an eyot just north of the George and Dragon Hotel at Wargrave, past Shiplake Station almost to the point where the non-functioning Bolney Ferry is marked on the 1 in. Ordnance map. Over this stretch it was examined from a small boat after observation from a river steamer, and it occurs both in Berkshire and Oxfordshire. From Bolney to Hurley nothing more was seen of *P. nodosus*. J. E. LOUSLEY.

737/16. POTAMOGETON PERFOLIATUS L. 3, S. Devon; river Otter below Otterton, 1942, E. C. WALLACE.

*†744/1. CYPERUS LONGUS L. 23, Oxon.; in the wild part of Mill Meadow Recreation Ground, Henley-on-Thames, 1941. Here the plant is certainly not native, but is flourishing in wet ground almost on the river-bank, where it is likely to be carried down by winter floods to the water-meadows below Henley, J. E. LOUSLEY. 24, Bucks.; in two spots 200 yards apart near the R. Chess near Chesham, 1941, D. MCCLINTOCK.

745/3. HELEOCHARIS MULTICAULIS (Sm.) Sm. 16, W. Kent; boggy patch of ground south of Hawkenbury, 1942, J. R. WALLIS.

746/2. SCIRPUS MARITIMUS L. 33, E. Glos.: R. Severn, Forthampton, 1939, F. M. DAY.

[*]746/8. SCIRPUS PAUCIFLORUS Lightf. 12, N. Hants.; marsh near North Warnborough, 1941, E. C. WALLACE. *47, Montgomery; bog c. 1000 ft. on Boncyn Celyn, S.E. of Lake Vyrnwy, 1942, J. W. GOUGH and N. Y. SANDWITH.

753/3. CAREX ACUTIFORMIS Ehrh. 39, Staffs.; Walton's Wood, Madeley, 1942 (No. 2543), E. S. EDEES.

753/6. Carex saxatilis L. 92, S. Aberdeen; sparingly on Cairn Toul, 1941, R. Mackechnie and E. C. Wallace.

753/7. Carex rostrata Stokes in With. 39, Staffs.; Chartley Moss, Stowe, 1942 (No. 2483), E. S. Edees.

753/8. Carex lasiocarpa Ehrh. 61, S.E. Yorks.; Kelleythorpe Marsh, Driffield, 1942. Given as extinct in East Yorks. in Robinson's *Flora*. Growing with *C. diandra*, which was noted here in 1939, though I then missed the *C. lasiocarpa*, W. A. Sledge.

753/9. Carex hirta L. 39, Staffs.; Newcastle, 1942 (No. 2477), E. S. Edees.

753/9d. Carex hirta L. var. spinosa Mort. 37, Worcs.; Naunton: Ripple; 1939, F. M. Day, det. E. Nelmes.

753/10. Carex pendula Huds. 39, Staffs.; Walton's Wood, Madeley, 1942 (No. 2466), E. S. Edees.

753/12. Carex strigosa Huds. 23, Oxon.; still in Noke Wood, Sibthorp's locality (not found there since Sibthorp's time according to Druce, 1927, *Fl. Oxf.*, ed. 2, 458), 1941, N. Y. Sandwith.

753/13. Carex helodes Link. 6, N. Somerset; very local in one spot in damp wooded valley between Nettlebridge and Edford, 1941, C. I. and N. Y. Sandwith. (The first certain record for the Bristol area). 8, S. Wilts.; Great Bradley Wood, also Penstones Wood, 1941, J. D. Grose. 39, Staffs.; Walton's Wood, Madeley, 1942 (No. 2460), E. S. Edees. 57, Derbs.; Tansley Moor, 1942, D. McClintock.

753/25. Carex digitata L. 63, S.W. Yorks.; Anston Stones Wood, 1942, W. A. Sledge.

753/27. Carex humilis Leyss. 8, S. Wilts.; a number of additional records given by Welch and Grose (1942 : 77).

753/32. Carex pilulifera L. 30, Beds.; Deadmansea Wood, Whipsnade, 1942, A. J. Wilmott.

753/34. Carex pallescens L. 30, Beds.; Deadmansea Wood, Whipsnade, 1942, V. H. Chambers, comm. A. J. Wilmott. 36, Heref.; Old Country Wood, Coddington, 1942, F. M. Day.

753/35. Carex vaginata Tausch. 92, S. Aberdeen; Beinn Bhrotain, Cairngorms, 1941, E. C. Wallace.

753/47. Carex aquatilis Wahl. 69, Westmorland; Elterwater, and by the Brathay near Skelwith, 1942, E. C. Wallace.

753/49e. Carex Goodenowii Gay var. juncea (Fr.) Asch. 41, Glam.; Kenfig Pool, 1942, Miss E. Vachell, confirmed by E. Nelmes.

753/54. Carex Lachenalii Schkuhr. 92, S. Aberdeen; in great abundance on Cairn Toul, northern slopes, 1941, R. Mackechnie and E. C. Wallace.

753/57×59. Carex remota L. × Otrubae Podpera. 63, S.W. Yorks.; ditch near Chapel Hill, Balne, W. A. Sledge. Fishlake, by a grass lane leading to Jubilee Bridge, Thorne, 1942, Dr J. M. Taylor, comm. W. A. Sledge.

*753/58. Carex canescens L. 47, Montgomery; bog on mountains between Hirnant and Lake Vyrnwy, 1942, J. W. Gough and N. Y. Sandwith.

753/59. Carex Otrubae Podp. 54, N. Lincoln; ditches inland from Skegness, 1942, E. C. Wallace.

*753/59(2). Carex vulpina L. 33, E. Glos.; Coombe Hill Canal, 1941, E. Nelmes.

753/60. Carex spicata Huds. (C. contigua Hoppe). 39, Staffs.; Eccleshall (No. 2535): Ashley (No. 2536), both 1942, E. S. Edees.

*753/61. Carex Pairaei F. Schultz. 8, S. Wilts.; Chute (Grose, 1940 : 337).

753/63. Carex paniculata L. 34, W. Glos.; The Quabs, Bromsberrow, 1940, F. M. Day.

753/67. Carex arenaria L. 54, N. Lincs.; Laughton Common, John Brown (1941 : *N.W.Nat.*, *16*, 332).

*753/75. Carex dioica L. 47, Montgomery; bog c. 1000 ft. near summit of Boncyn Celyn, S.E. of Lake Vyrnwy, 1942, J. W. Gough and N. Y. Sandwith

†756/1. Setaria italica (L.) Beauv. 16, W. Kent; waste ground, Green Street Green, 1941, J. E. Lousley.

†765/7. Phalaris paradoxa L. 39, Staffs.; brewery alien, Burton-on-Trent, 1936, R. C. L. Burges, det. C. E. Hubbard, comm. J. E. Lousley.

766/1b. Anthoxanthum odoratum L. var. longiaristatum Celak. 39, Staffs.; roadside between Dunwood and Rudyard, Longsdon, 1942, E. S. Edees.

770/1×5. ×Alopecurus hybridus Wimm. 6, N. Somerset; pasture on Tickenham Moor, 1942, C. I. and N. Y. Sandwith: new to the Bristol district.

770/6. Alopecurus aequalis Sobol. 12, N. Hants.; drained bed of Fleet Pond, 1941, E. C. Wallace.

777/1g. Phleum pratense L. var. nodosum (L.) Schreb. 39, Staffs.; roadside on the Westlands estate, Newcastle, 1941, E. S. Edees (*Trans. N. Staffs. Field Club*, 1941-42, as *P. nodosum* L.).

783/1. Calamagrostis epigeios (L.) Roth. 63, S.W. Yorks.; near Barnby Dun, John Brown (1941 : *N.W.Nat.*, xvi, 332).

*783/2. Calamagrostis canescens (Weber) Gmel. em. Druce. 92, S. Aberdeen; a small patch in sedgy wood by the Dee at Braemar, 1941, an interesting extension of range, R. Mackechnie and E. C. Wallace.

783/4c. Calamagrostis neglecta (Ehrh.) Beauv. var. Hookeri (Syme). 90, Forfar; Rescobie, 1941, Miss U. K. Duncan. A most interesting re-discovery of a plant long considered "extinct" there, Ed.

784/1. Gastridium lendigerum (L.) Gaud. 13, W. Sussex; woodland glade in clearing, Loxwood, 1941, E. C. Wallace.

*785/2. Apera interrupta (L.) Rchb. 54, N. Lincs.; sandy roadside, Seacroft, south of Skegness, 1942, E. C. Wallace.

791/2. Deschampsia alpina (L.) R. & S. 92, S. Aberdeen; Coire an t'Saighdeir, Cairn Toul, 1941: several places on Beinn Bhrotain and on the Monadh Mor, 1941: 100, Clyde Isles; Glen Sannox, 1937; R. Mackechnie and E. C. Wallace.

*794/2. Avena pubescens Huds. 46, Cardigan; Towyn Warren, 1941, J. A. Whellan, comm. Nat. Mus. Wales.

†794/6. Avena strigosa Schreb. [29, Cambs.; "the record in 1939-1940 *Report*, p. 303, for Southam should be cancelled: the plant is *A. fatua*," F. M. Day.] 34, W. Glos.; a single plant on rubbish heap, Bromsberrow, 1942: 37, Worcester; Cotheridge, 1940; F. M. Day.

*795/2. Arrhenatherum tuberosum (Gilib.) Druce. 48, Merioneth; Brithdir, 1941, J. A. Webb, comm. Nat. Mus. Wales.

*800/1. Sieglingia decumbens (L.) Bernh. 47, Montgomery; pasture at E. end of Lake Vyrnwy, near Llanwddon, 1942, J. W. Gough and N. Y. Sandwith.

818/1. Melica nutans L. 63, S.W. York.; wood on Permian Limestone near Thorpe Salwin, 1940, John Brown (1941 : *N.W.Nat.*, xvi, 206, as *M. montana* Huds.).

824/9. Poa glauca Vahl. 98, Argyll; Ben Douran, 1940, E. C. Wallace.

[*]825/3(2). GLYCERIA DECLINATA Bréb. 8, S. Wilts.; Folly Farm, Bedwyn (Grose, 1940, 337). 34, W. Gloucester; on the mud of dried-up ponds on Inglestone Common near Wickwar, 1941, C. I. and N. Y. SANDWITH. (The first record for the Bristol area, and new to district 5 of Gloucestershire). *99, Dumbarton; by a small stream entering the Clyde near Bowling, 1932, R. MACKECHNIE.

826/4b×829/1. FESTUCA PRATENSIS Huds. × LOLIUM PERENNE L. 39, Staffs.; roadside, Ipstones, 1942, E. S. EDEES

826/18. FESTUCA MYUROS L. 18, S. Essex; rubbish tips, Dagenham, 1939, J. E. LOUSLEY and E. C. WALLACE.

†827/1(2). BROMUS GUSSONEI Parl. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE.

†827/4. BROMUS TECTORUM L. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE.

†827/8. BROMUS RUBENS L. 25, E. Suffolk; Felixstowe Docks, 1939, J. E. LOUSLEY and E. C. WALLACE

†827/9. BROMUS INERMIS Leyss. 54, N. Lincoln; sea front at Skegness, 1942, E. C. WALLACE.

†827/13. BROMUS UNIOLOIDES H. B. & K. 25, E. Suffolk; Felixstowe Docks, 1938, J. E. LOUSLEY.

827/19(2). BROMUS LEPIDUS Holmberg. 7, N. Wilts.; near Aldbourne, J. D. Grose (1940: 337) and J. E. Lousley. 12, N. Hants.; Tunworth, 1942, N. E. G. CRUTTWELL: 17, Surrey; fields at Addington, 1942, A. L. STILL. 39, Staffs.; sandy roadside, Tyrley, 1942 (No. 2556), E. S. EDEES. †61, S.E. Yorks.; Aughton near Bubwith: †63, S.W. Yorks.; near Gale Common, south-east of Knottingley: near Auckley: †65, N.W. Yorks.; fields near Leckby Carr, W. A. SLEDGE. Catterick Bridge, Hudswell, Sedbury Bottom, Downholme Park and Arrathorne, C. M. ROB. All Yorks. records 1942.

†829/4. LOLIUM MULTIFLORUM Lam. 39, Staffs.; Audley, 1942, E. S. EDEES.

830/1×2. AGROPYRON JUNCEUM (L.) Beauv. × PUNGENS R. & S. 54, N. Lincoln; sea shore south of Skegness, 1942, E. C. WALLACE, det. C. E. HUBBARD.

830/1×2d. AGROPYRON JUNCEUM (L.) Beauv. × PUNGENS R. & S. var. ARISTATUM Hack. 54, N. Lincoln; dunes south of Skegness, 1942, E. C. WALLACE, det. C. E. HUBBARD.

836/3. ELYMUS EUROPAEUS L. 63, S.W. Yorks.; Anston Stones Wood, 1942, W. A. SLEDGE: 65, N.W. Yorks.; in plenty in woods along south bank of Swale from Lownthwaite to below Colburn, 1942, C. M. Rob.

*844/2×5. ×Equisetum litorale Kühl. 2, E. Cornw.; Caerhays (with *E. palustre* L.), 1941, A. H. G. Alston.

844/3. Equisetum sylvaticum L. 17, Surrey; woodland glade, south of Dunsfold on Sussex border, 1941, E. C. Wallace.

854/1. Polystichum setiferum (Forsk.) Woynar. 60, W. Lancs.; glen near Lancaster, gritstone rocks, 1942, J. N. Frankland.

854/1b. Polystichum setiferum (Forsk.) Woynar var. hastulatum Druce. 4, N. Devon; Long Hayne, Cove, Tiverton, 1941, A. L. Still, comm. E. C. Wallace. 17, Surrey; lane near Bowlhead Green, 1937, E. C. Wallace.

854/1c. Polystichum setiferum (Forsk.) Woynar var. alatum (Moore) Druce. 4, N. Devon; Palfrey Lane, Cove, Tiverton, 1941, A. L. Still, comm. E. C. Wallace.

856/5. Dryopteris aemula (Ait.) Kuntze. 62, North-east York.; Hackness, 1939, a re-discovery, C. A. Cheetham and S. P. Rowlands (1940 : *Naturalist*, 24).

*856/11. Dryopteris Robertiana (Hoffm.) C. Chr. 62, N.E. Yorks.; railway track in Newton Dale, Mr Highfield (W. A. Sledge; 1941 : *Naturalist*, 12).

863/1. Hymenophyllum tunbrigense (L.) Sm. 14, E. Sussex; near Lye Green, 1941, D. McClintock.

870/5. Lycopodium clavatum L. 41, Glam.; Mynydd Margam, 1942, Miss M. Thomas and Miss E. Vachell, confirmation of old record.

†868/1. Azolla filiculoides Lam. 7, N. Wilts.; Kennet and Avon Canal, Limpley Stoke, 1939, Cecil Sandwith (*N.W.Nat., 15,* 266).

†871/2. Selaginella Kraussiana A. Braun. 3, S. Devon; near Grenofen Bridge, south bank of R. Walkham, Buckland Monachorum, 1941, Miss K. H. Johnstone, comm. E. M. Phillips.

THE WEATHER OF 1941 AND 1942 AND ITS EFFECTS.

(Adapted by permission from the Phenological Reports of the Royal Meterological Society.)

1941.

The year opened with a cold January, as in the preceding year, but was of a different type in other respects. February produced much snow, including a fall in the N.E. district which gave an equivalent rainfall 744 per cent. of the average for the week commencing 16th February. Under the influence of northerly and north-easterly winds, which were very persistent, the temperature remained below the average (although not very markedly except for a mid-May frost) almost continuously until the third week in June, when a warm, dry, sunny period occurred, lasting for about four weeks, after which conditions again deteriorated, August being wet. Conditions improved at the end of that month, and the autumn was genial.

This unusual season caused a certain amount of uncertainty and irregularity in the appearance of plants such as are usual when the temperature for long periods rarely exceeds the average to any extent. Many plants were up to three weeks later than usual in flowering until the warm June-July spell, which was followed by a general " catch up " and a tendency to earliness amongst the late summer flowers. In Scotland the season was fairly good for alpine plants, about average in the Braemar district. Sedges on Ben Douran in Argyll were definitely later and poorer than in 1940.

The year will be remembered for having made amends for a belated summer, and for some damage to blossom and foliage in the spring. In parts of Surrey and Sussex, mostly in the Weald, the oaks were stripped bare of leaves while in flower by a frost and myriads of caterpillars. The countryside in autumn was greener than usual, with unusually late defoliation of our trees, and a poor show of autumn colours.

1942.

Again the year began, after a mild December, with a cold spell which lasted until mid-March and which included the coldest February in England and Wales since 1895. Frosts, however, were not very intense and the normal daily temperatures were reached on a few occasions. From this point until the second week in June there was a period, free from any return to harmful frosts, with three warm spells and with a dry sunny spell in the middle third, preceded and followed by rainy spells. This dry period produced a drought of 32 days—the longest for 13 years—during the greater part of which winds between N. and E. prevailed, mean temperatures being not far from normal, with relatively warm days and cool nights. June was a dry month, cold in the middle, but ending as it began with a cold spell. After the first week in July, temperature and sunshine were mainly below, and rainfall above, the normal, and although temperature rose markedly at the end of August there was no dry sunny period of any duration during that month. The period September-October produced a sequence consisting of a warm dry sunny spell, a cold wet sunless spell and a warm wet sunless ending.

Plants were late again in the spring, due as much to the drought conditions as to the cold. In Yorkshire the lateness of the ash in coming into leaf was most marked, it being a month behind 1941. It also flowered poorly and so " keys " were scarce in the autumn.

The harvest had been good over the whole country, and exceptional in some parts. As the result of the amount of rain in the later part of the summer there was enough aftermath growing in many grass fields to enable farmers to make more silage. The abundance of the year in respect of crops extended to cultivated and wild fruits of almost every kind, although it is not likely to be generally remembered as a genial summer owing to the frequent occurrence of weeks with deficient sunshine. The appearance of the grass fields in autumn was exceptionally green, and the weather was sufficiently quiet and free from frost to produce a wealth of autumn colours. Reference has been made by observers and in the Press to the particularly rich golden brown colour of the oaks, which, in sheltered places, kept their foliage into December.

E. C. WALLACE.

NOMENCLATURE AND CORRECTIONS TO BRITISH PLANT LIST.

A. J. Wilmott.

This section includes alterations which have been made in the course of preparing this Report. It is hoped that members who are sending in Plant Records for 1943 will correct their copies of *B.P.L.* before doing so.

In some instances it will be found that names have been used contrary to *B.P.L.*, ed. 2, without any correction being inserted here. This has been done only when present circumstances have prevented adequate investigation being made. It is undesirable to list the alteration as a correction to *B.P.L.* until the investigation can be completed. In these instances the *B.P.L.* number will always be added to indicate the plant for which the name has been substituted.

The tracing of the correct authorities for varietal names is frequently a matter of considerable difficulty, and when an authority has not been found easily, it is inserted in this section. It is often difficult to be quite certain that a given combination has not been previously published, but when it seems extremely probable that this is the case, "*comb. nov.*" is added (and should in use be replaced by "Wilmott"). When no publication of the combination has been traced, but it seems very likely that it has appeared somewhere, "*comb. nov.* [?]" is used. I should be pleased to receive any corrections, towards the next edition of the *Plant List*.

Abbreviations of Authors' Names. Some of the abbreviations used in the *British Plant List* are not the usual ones, and the following alterations should be made throughout:—

R.Br. [Robert Brown].—Br. by priority would refer to "P.Br.," i.e. Patrick Browne, author of "The Civil and Natural History of Jamaica," 1756.

Rchb.—Reichb. is an unnecessary lengthening of this well-known abbreviation for H. G. L. Reichenbach. Reich. indicates the earlier Reichard, whose name is better given in full to avoid confusion.

Rchb. f.—Or Rchb. fil., similarly for the son, H. G. Reichenbach.

In connexion with the entries under *Hieracium*, a few words of explanation seem necessary concerning the correct use of the terms "*sp. nov.*", "*nom. nov.*", and "*comb. nov.*", after a new name. When a plant is described as a new species based on a new type, the term *sp. nov.* should be used. The modern use of the type method for obtaining fixity of application of name makes it necessary to differentiate between *sp. nov.*, with a new type, and *nom. nov.*, which is used when a new name or new epithet is given to a previously described plant because the one by which it has previously been known has been shown to be illegitimate according to International Rules of Nomenclature, needing replacement, therefore, by a new one, i.e. *nom. nov.* The type of a *nom. nov.* remains the same as it was under the previously used, though illegitimate, name. Again, when a previously published epithet is adopted in a different genus or with a different rank, to form a name consisting of a different combination of words, this new combination is termed *comb. nov.* It should be clear that no change of type can be permitted in such a case, for if the same epithet, *intended* to indicate the same plant, were allowed to have a different type according to the combination in which it appeared, the value of the type method as a means of obtaining fixity and stability in nomenclature would be seriously undermined. It is, therefore, not correct to use the term *sp. nov.* in the sense either of *nom. nov.* or of *comb. nov.*, for technically it indicates that the author may have selected a new type, which in fact he could not, or should not, have done, in view of the nature of his " protologue," i.e. original published account. Thus *Hieracium* 164(2) " *fulvocaesium* Pugsl., sp. nov.", was published with no explanation but the reference to *H. orarium* var. *fulvum* Hanb. . . . (1894): there is no description other than that given in the reference cited, so the type *must* be that of *H. orarium* var. *fulvum*. *H. fulvocaesium* is therefore not a *sp. nov.*, but a *nom. nov.*: as a *sp. nov.* it could be considered to have no description and no type, i.e. to be *nom. nudum*, a mere name, and therefore illegitimate. Again, 129 *H.* " *anglorum* (Ley) Pugsl., sp. nov." was published solely with the reference to " *H. scanicum* var. *anglorum* Ley . . . (1909); non *H. scanicum* Dahlst. . . . (1894)." The citation " (Ley) Pugsl." indicates that a previously published epithet has been *adopted*, and that the type depends on the protologue of " (Ley)." If a *sp. nov.* were intended, the " (Ley) " would have to be omitted and the new type stated, and something new in the way of description added to show why the type had been changed. *H. anglorum* (Ley) Pugsl., published in *this* form, cannot be *sp. nov.*, but must be *comb. nov.* The application of the type method needs to be made with care, for otherwise, wrong uses of the terms may cause considerable argument, and create trouble concerning the typification of new names, and concerning their consequent validity or illegitimacy. In adding the names of *Hieracia* in this section, I have, therefore, added the term which correctly indicates the nature of the novelty, when it was not thus designated in the original publication. The use of " *haud* " in synonymy here indicates that the first cited author *misidentified* the plant described by the author following the *haud*: *non* indicates that the two uses of the name or epithet were independent and unconnected.

13 *DELPHINIUM*—See Wilmott: 1942A.
3 *Gayanum* Wilmott (D. Ajacis auct., haud L.).
4 *Ajacis* L. sec. Wilmott (D. orientale Gay).

54 BRASSICA.
14 **haber** (DC.) Wheeler.—See *1938 Rep.*, 23.
b. **orientalis** (L.), comb. nov.

18(2). *integrifolia* (West) O. E. Schulz.
  b. *carinata* (A. Br.) O. E. Schulz—[in Engler 1919: *Pflanzenr.*, iv, 105, p. 58], (*B. carinata* A. Br. 1841; *Sinapis abyssinica* A. Br. ap. Regel).—See Plant Notes.

59 **CAPSELLA** Medik.—*Nomen conservandum.*
1 **Bursa-pastoris** (L.) Medik.
2-28 All as of "[E. Almq.]" comb. nov., unless any of the combinations have been previously used. E. Almquist treated these ["species element." i.e. "elementary species"] as subdivisions of *Capsella Bursa-pastoris.* This treatment made all his names illegitimate by Art. 13 of the International Rules, which forbids the subdivision of species into species. They would be better treated as subspecies.
29 **penarthae** (Shull), comb. nov.—*Bursa penarthae* Shull 1929; see Plant Notes.

88 **VIOLA.**
8 **odorata.**
  d. **dumetorum** (Jord.) Rouy & Fouc.—1896: *Fl. Fr.*, iii, 25.
  f. **floribunda** (Jord.) Rouy & Fouc.—1896: *l.c.*
  h. **subcarnea** (Jord.) Parl.—1890: *Fl. Ital.*, ix, 130.

112 **HYPERICUM.**
14 ×**dubium**; ×**H. Desetangsii** Lamotte.—Erroneously in 1939-40 Rep., 313, as *H. perforatum* × *quadrangulum.* Delete "× quadrangulum" from *B.P.L.*: cf. ×*H. dubioides* Druce in *1928 Rep.*, 868.

153 **MEDICAGO.**
6 **minima.**
  g. *pulchella* Lowe.—See Plant Notes.

155 **TRIFOLIUM.**
20 **campestre** Schreb. (T. procumbens auct., vix L.).

185 **RUBUS.**
17 **incurvatus.**
  c. **minor** W. Wats. ex. J. W. H. Harrison *et al.*—See Plant Notes.

190 **ALCHEMILLA.**—See Wilmott 1939: *J.B.*, lxxvii, 249-250.
1 **minor** Huds. sec Wilmott (A. pubescens Lam.).
4 **pseudominor** Wilmott (A. minor auct. haud Huds.).
4(2) **filicaulis** Buser—*Vice* 4b.

194 **ROSA.**
7 **squarrosa.**
  r. **rupicola** (J. W. H. Harrison ex J. W. H. Harrison *et al.*), comb. nov—[See Plant Notes].

289 *SYMPHORICARPOS.*

*1 *racemosus* Mich.—*Vice* tautonym.

355 *MADIA.*

3 *capitata* Nutt. N. Amer. (Oregon-California).—See Plant Notes.

368 ANTHEMIS.

2 **nobilis.**

c. **discoidalis** J. W. H. Harrison ex J. W. H. Harrison *et al.*—See Plant Notes.

419 HIERACIUM.—From Pugsley 1941: *J.B.*, lxxix, 177-183, 193-197, to which the page numbers here cited refer, and where the detailed references of the synonymy are given. The numbers given have been passed or chosen by Mr Pugsley.

10(2) **scarpicum** Pugsl.—p. 180.

11(2) **ebudicum** Pugsl.—p. 179.

11(3) **hebridense** Pugsl.—p. 179.

25(2) **Grovesii** Pugsl.—p. 177.

30 **globosiflorum** Pugsl.—p. 178, *H. globosum* Backh. 1856, non Desf. 1829.

32(2) **macrocarpum** Pugsl.—p. 177.

33(2) **pseudanglicum** Pugsl.—p. 178

33(3) **gracilifolium** (Hanb.) Pugsl.—p. 178, comb. nov. (not " nom. nov."). *H. nigrescens* var. *gracilifolium* Hanb. 1892, pro parte. [Type is that of Hanbury's variety.]—Delete 44b.

34(2) **cremnanthes** (Hanb.) Pugsl.—p. 178, comb. nov. *H. Marshalli* var. *cremnanthes* Hanb. 1892.—Delete 49b.

36 **Hanburyi** Pugsl.—p. 178. *H. chrysanthum* Backh. 1855, non Ledeb. 1853.

39 **pseudocurvatum** (Zahn) Pugsl.—p. 178, comb. nov. *H. nigrescens* Backh. 1856, haud Willd. *H. curvatum* Hanb. 1894, haud Elfstrand. *H. nigrescens* var. *pseudocurvatum* Zahn 1921. [Type a Backhouse specimen not seen by Zahn.]

47 **hyparcticoides** Pugsl.—p. 179, nom. nov. *H. hyparcticum* Hanb. 1894, haud Almq. ex Elfstrand. [Type from Ben More Assynt, coll. Hanbury or Marshall.]

49(2) **dasythrix** (Linton) Pugsl.—p. 179, comb. nov. *H. Pictorum* var. *dasythrix* Linton 1893.—Delete 121b.

63 [**pseudorepandum** Pugsl.—p. 181, nom. nov. *H. repandum* (Ley) Ley 1905, non Schrank 1813. Mr Pugsley writes that he " deliberately ignored '*repandulare*,' which is not a Latin word," but although not inserted in Art. 27 of the *International Rules of Botanical Nomenclature* (1935: p. 7), which deals with names of species, it probably should be presumed that the words in Art. 25 (p. 6, dealing with names of genera and their subdivisions), viz., " These

names may be . . . composed in an absolutely arbitrary manner," would also apply in Art. 27 and would legitimise the epithet "*repandulare.*"]

63(2) **Riddelsdellii** Pugsl.—p. 181, nom. nov. *H. ciliatum* var. *venosum* Ley 1907, non *H. venosum* L. 1753.—Delete 63b.

63(3) **basalticolum** Pugsl.—p. 181.

64 **ciliatiflorum** Pugsl.—p. 194. *H. ciliatum* Almq. 1871, non Willd. 1800.

66(2) **deganwyense** Pugsl.—p. 180.

72(2) **Beebyanum** Pugsl.—p. 181.

73 **chloranthum** Pugsl.—p. 180, nom. nov. *H. onosmoides* Hanb. 1892, haud Fries 1848. *H. buglossoides* Linton 1893, haud Arv.-Touv. 1876. *H. saxifragum* var. *pseudonosmoides* Hanb. 1904. [Type should be based on Hanbury 1892: best selected from the specimens collected on sandhills near Balintore, E. Ross.]

74(2) **subplanifolium** Pugsl.—p. 181, nom. nov. *H. lasiophyllum* var. *planifolium* Hanb. 1892, non *H. planifolium* Brenner 1894. [Type is that of Hanbury's variety.]—Delete 55c.

76 **fratrum** Pugsl.—p. 182. *H. sordidum* W. R. Linton ex Linton 1911, non Gillies 1835.

77(2) **britanniciforme** Pugsl.—p. 182.

80(2) **carneddorum** Pugsl.—p. 180, nom. nov. *H. Sommerfeltii* var. *splendens* Hanb. 1897, non *H. splendens* Elfstrand 1896. [Type that of Hanbury 1887, i.e. specimen in Hb. Hanbury cultivated by Ley (1897), from Nant Francon, Carnarvonshire.]—Delete 80c.

91(2) **subprasinifolium** Pugsl.—p. 193.

91(3) **pseudo-Stenstroemii** Pugsl. (as *Pseudo-Stenstroemii*)—p. 194. *H. silvaticum* var. *Stenstroemii* F. N. Williams 1902, haud *H. serratifrons* var. *Stenstroemii* Dahlst. 1893. This is apparently sp. nov.! although no description is given, and no type cited, since it is not a change of name for 85 *Stenstroemii.* F. N. Williams's account (*Prodr. Fl. Brit.*, i, 134) of "*H. silvaticum* var. *Stenstroemii*" must presumably be regarded as the "protologue." The type should therefore be in Herb. Hanbury, from "Upper Wharfedale, Yorkshire, collected 1891," presumably named as *H. murorum* var. *Stenstroemii* (Hanbury, in *Lond. Cat.*, ed. ix, n. 952d: cited by F. N. Williams).

92(2) **semicrassiceps** Pugsl.—p. 194.

99 **cuneifrons** (Ley ex W. R. Linton) Pugsl.—p. 183, comb. nov. *H. subulatidens* var. *cuneifrons* Ley ex W. R. Linton 1905. [Type that of W. R. Linton, 1905.]—Delete 99 and 99b.

99(2) **itunense** Pugsl.—p. 193.

100(2) **pollinarioides** Pugsl.—p. 193.

106(2) **tricolorans** (Zahn) Pugsl.—p. 182, comb. nov. *H. silvaticum* var. *tricolor* W. R. Linton 1905. *H. bifidum* subsp. *tricolorans* Zahn 1921. [Type that of W. R. Linton, 1905.]—Delete 156c.

106(3) **subcyaneum** (W. R. Linton) Pugsl.—p. 182, comb. nov. *H. silvaticum* var. *subcyaneum* W. R. Linton 1905. [Type that of W. R. Linton, 1905.]—Delete 156d.

106(4) **silvaticoides** Pugsl.—p. 182.

110 **oïstophyllum** Pugsl.—p. 194. *H. sagittatum* Lindb. ex Stenstr. 1889, non H. & L. 1809.

110(2) **subhirtum** (Hanb.) Pugsl.—p. 194, comb. nov. *H. rivale* var. *subhirtum* Hanb. 1894.—Delete 110b.

117(2) **crebridentiforme** Pugsl.—p. 195.

117(3) **auratiflorum** Pugsl.—p. 195.

120(2) **clivicolum** (Hanb.) Pugsl.—p. 195, comb. nov. *H. euprepes* var. *clivicolum* Hanb. 1894. [Type that of Hanbury, 1894.]—Delete 120c.

121(3) **uisticolum** Pugsl.—p. 195.

127 **submutabile** (Zahn) Pugsl.—p. 197. *H. mutabile* (Ley) Ley 1909, non F. Schultz 1845. *H. vulgatum* var. *submutabile* Zahn 1921, "?" according to Pugsley, but the "?" must be ignored, for the new combination cannot be made unless Zahn's type is adopted. [The type is that of *H. vulgatum* var. *mutabile* Ley 1900.]

129 **anglorum** (Ley) Pugsl.—p. 197, comb. nov. *H. scanicum* var. *anglorum* Ley 1909, haud *H. scanicum* Dahlst. 1894.

131(2) **subminutidens** (Zahn) Pugsl.—p. 197, comb. nov. *H. caesium* var. *subminutidens* Zahn 1921.—Delete 166b.

134(2) *lepidulum* Stenstr.—p. 197.

150(2) **neocoracinum** Pugsl.—p. 183, nom. nov. *H. caesium* var. *subminutidens* Zahn 1921.—Delete 174b.

152(2) **pseudosarcophyllum** Pugsl.—p. 183. *H. sarcophyllum* W. R. Linton 1905 ex parte, haud Stenstr. 1889.

154(2) **cillense** Pugsl.—p. 183, described as sp. nov. with one of Ley's specimens of *griseum* as type: really nom. nov. with new description added. *H. hypochaeroides* var. *griseum* Ley 1905. [*H. griseum* Ley MS., non Formanek 1896.]—Delete 74b.

159(2) **caesiopilosum** Pugsl.—p. 196.

164(2) **fulvocaesium** Pugsl.—p. 196, nom. nov. *H. orarium* var. *fulvum* Hanb. 1894.—Delete 178b.

164(3) **erythraeum** [W. R. Linton] Pugsl.—p. 196, as "sp. nov.", with description and indication of type. W. R. Linton's use of the epithet is invalid, being without description, but the citation of his name in brackets is harmless, as the Linton material is all that is at present known, and the typification is unaffected.

172(2) **vennicontium** Pugsl.—p. 196. nom. nov. *H. euprepes* var. *glabratum* Linton 1893, non *H. glabratum* Hoppe ex Willd. 1800. [Type is that of Linton's variety.]—Delete 120b.
173(2) **melanochloricephalum** Pugsl.—p. 195.
176(2) **angustisquamum** (Pugsl.) Pugsl.—p. 197, comb. nov. *H. holophyllum* var. *angustisquamum* Pugsl. 1920.—Delete 176c.
184(4) **Roffeyanum** Pugsl.—p. 197.
187(2) *speluncarum* Arv.-Touv.—p. 177.

457 **LIMONIUM.**
1 **vulgare** Mill.—*Vice* tautonym.
4 **bellidifolium** (Gouan) Dumort.—(*Statice Limonium* var. *bellidifolia* Gouan 1760: Fl. Monsp. 231). The Maltese *Statice reticulata* L. is apparently not the same as the British plant.
×**binervosum**—[See Plant Notes: some specimens considered to be possibly this hybrid].

480 **GENTIANA.**
4 **Amarella.**
c **pallida** (Pugsl.) comb. nov. [?]—*G. axillaris* var. *pallida* Pugsl. 1936: *J.B.*, lxxiv, 165, 169; I can find no previous combination.

482 **NYMPHOIDES.**
1 **orbiculata** Gilib.—Gmelin's epithet "*peltatum*," though a year earlier than that of Gilibert, was illegitimate, as he should have adopted that of "*nymphoides* (L.)" under his new genus *Limnanthemum*.

490 *OMPHALODES.*
2 *verna* Moench—*Vice* tautonym.

522 *DATURA.*
1 *Stramonium.*
b. *chalibea* Koch—1844: *Syn. Fl. Germ.*, ed. 2, 586. *D. Tatula* L.

527 **VERBASCUM.**
1 *phlomoides* L.—With small initial "p."

532 **LINARIA.**
1 **vulgaris** Mill.—*Vice* tautonym.

545 **EUPHRASIA.**—See Plant Notes.
5 **nemorosa.**
h. **imbricata** Callen.
18 **confusa.**
c. **maciana** Callen.

548 RHINANTHUS.—See 1939-40 Rep., 361-379.
5(2) **calcareus** Wilmott.
6 **spadiceus** Wilmott. (R. monticola auct. non Lamotte.)
  b. **orcadensis** (Wilmott) comb. nov.
7 **borealis** (Sterneck) E. S. Marshall.
  ×**spadiceus** = × *R. Gardineri* Druce.
8(1) **Lintoni** Wilmott.
8(2) **lochabrensis** Wilmott.

615 POLYGONUM.—See Plant Notes.
3 **Bistorta.**
  a **puberulum** G. Beck.
4 **viviparum.**
  c **Roessleri** (G. Beck) comb. nov. [?].
9 **Hydropiper.**
  c **obtusifolium** A. Br.
27 *sagittatum.*
  b. *americanum* Meisner.
32 *Sieboldii* De Vriese. (P. cuspidatum Sieb. & Zucc. non Willd.) —cf. Bailey 1924: *Man. Cult. Plants*, 246.

616 *FAGOPYRUM.*
1 *sagittatum* Gilib.—*Vice* tautonym.

638 PARIETARIA.
1 **diffusa** M. & K.—*P. ramiflora* Moench is *nomen illegitimum superfluum*, since Moench cites *P. judaica* L. as synonym.

650 SALIX.
3 **alba.**
  b. **caerulea** (Sm.) Koch—1837: *Syn. Fl. Germ.*, ii, 644.

651 POPULUS.
*6 *candicans* Ait.—The identity of *P. Tacamahacca* Mill. is disputable; cf. Rehder 1940: *Manual Cult. Trees and Shrubs*, ed. 2, 76, 77.

668 EPIPACTIS.
3(4) **pendula** C. Thomas.—See Plant Notes.

669(1) ORCHIS.
1 **purpurea.**
  c. **Brookei** (Wilmott) comb. nov.—See Plant Notes.

669(2) ANACAMPTIS.
1 **pyramidalis** (L.) Rich.
  b. **sanguinea** (Druce) comb. nov. [?]—*Orchis pyramidalis* var. *sanguinea* Druce 1929: *B.E.C. 1928 Report*, 639.

c. **fudayensis** (J. W. H. Harrison) J. W. H. Harrison.—The combination was made in January 1939 in *J.B.*, 77, p. 4; only in July 1939 by P. M. Hall (1938 Rep., p. 29; 1939).

691 POLYGONATUM.

3 **officinale** All.—*Vice* tautonym.

719 LUZULA.

4 **multiflora.**

a. **typica** (Beck) comb. nov. [?]—*L. erecta* var. *typica* Beck 1890: *Fl. Nied.-Ost.*, 159.

b. **congesta** (Thuill.) Koch—1837: *Syn. Fl. Germ.*, ii, 734. *Juncus congestus* Thuill. 1799: *Fl. Paris*, 179.

73~~5~~7 POTAMOGETON.

5 **alpinus.**

×**perfoliatus** (×**P. prussicus** Hagstr.).—See Plant Notes.

753 CAREX.

7 **rostrata** Stokes in With. (C. inflata auct. non Huds.)

51(2) **bicolor** All. Rhum.—See Plant Notes.

59 **Otrubae** Podp.—See 1939-40 Rep., 263; *C. vulpina* auct. brit., non L.; *C. nemorosa* Rebent. 1804 non Schrank 1789.

59(2) **vulpina** L. sec. Nelmes.—The second author should be cited so long as the former application of the name *C. vulpina* (=59) remains current.

847 PTERIDIUM.

1 **aquilinum.**

a. **typicum** R. M. Tryon, jr.—See Plant Notes.

VICE-COUNTIES.

A. J. Wilmott.

The system of collecting and recording data concerning the distributions of species on a basis of "vice-counties," areas more equal in extent than the counties themselves, was initiated over eighty years ago by H. C. Watson. Before his time knowledge of the distributions of the British species was slight. There existed a few local Floras and in addition the lists in Turner & Dillwyn's *Botanist's Guide*, but the standard British Floras were generally content to indicate a few localities known to the author. After his production (1835-37) of *The New Botanist's Guide*, Watson began and himself carried out all the work which gave us for the first time a working knowledge of the distribution in Britain of each British species of vascular plant.

At first, in the *Cybele Britannica*, Watson was content with the general view obtained by subdividing Britain into eighteen provinces, but before that work was finished he felt the need of more detailed knowledge, and because some of the counties were so much larger than the average he set out in the fourth volume (pp. 139-, 1859) a scheme for the division of Britain into 112 vice-counties, which were either the counties themselves (with the exception of small counties such as Rutland, Kinross, Clackmannan, and Nairn, which he added to larger ones) or subdivisions of large counties along lines which he defined. The statement of the boundaries of the vice-counties there given was repeated in the first edition of the *Topographical Botany* (i, 21-24 : 1873), in which the scheme was carried into effect. The map issued with it was a poor one, produced, as Watson himself states (*Top. Bot.*, ii, 585 : 1874), for "antecedent works," and is neither adequate nor in some respects accurate. Data were collected to such an extent, and the interest in the scheme was such, that the small first, privately distributed, edition (limited to 100 copies) was superseded by a second edition in 1883. The scheme was adopted by Ewing in a *Glasgow Catalogue of Native and Established Plants*, a second edition of which appeared in 1899, in which data are given for the Western and Central Counties of Scotland. A Supplement to the second edition of the *Topographical Botany*, by Arthur Bennett, appeared in 1905 (*Journ. Bot. Suppl.*), and a second Supplement by Bennett, C. E. Salmon and J. R. Matthews in 1929-1930 (*Journ. Bot. Suppl.*). All of these, with additional data from personal information, were condensed (not entirely accurately, unfortunately) in Druce's *Comital Flora*, published in 1932, in which the original statement of the vice-county boundaries was reprinted on the back of a new and better (but still neither adequate nor completely accurate) map.

During all these years it has in general been recognised that the boundaries of the vice-counties must be regarded as fixed and non-variable. Indeed, it should be obvious to the most casual student that if any boundary were at any time changed, the whole of the past records for the vice-counties concerned would need revision. Any such revision would necessitate the review of the whole of the literature investigated for all the records so far made and accepted. Stated this way, it should be quite clear that the value of the whole system is dependent upon the absolute permanence of the boundaries as defined and used by Watson in *Topographical Botany*, and either used or intended to be used by his successors. Admittedly the boundaries are not always such as we would draw to-day if we were initiating a similar work, but it must be repeated that if they are now altered, all past work on vice-county distribution in the areas concerned, carried on for nearly a century, becomes unsound and in need of revision.

The vice-county system was adopted by Kennard and Woodward over thirty years ago for Mollusca, and in recent years other branches of Zoology have begun to adopt the system. Owing to various causes, in part the rather vague definitions sometimes given by Watson, a few discrepancies in usage were noted by those of the Association for the Study of Systematics who were recommending the general adoption of the vice-county system for all groups. With a view to the clarification of these discrepancies and the settlement of the exact boundaries of all the vice-counties, it was proposed that a thorough investigation of the matter should be carried out and a detailed statement of the boundaries made, if possible with an adequate map. Our Society was asked for its co-operation, and just before the war a sub-committee was appointed to examine the problem. One joint meeting, with a representative of the A.S.S., was held, presided over by P. M. Hall, at which some preliminary decisions were made, which included the basic one on which all agreed, viz., that the boundaries of the vice-counties were those laid down by Watson, and should not be altered. Another decision was that when any vice-county is subdivided, the subdivisions must all be lettered, and not only in part, as in the past with 69 and 69A: it should be plain that "69" cannot be permitted to mean both the whole of Watson's vice-county 69 (i.e., Westmorland *with* North Lancashire) and also Westmorland *without* North Lancashire.

Unfortunately, certain suggestions have been published in recent years in which proposals for the "emendation" of the boundaries and numbering have been made. It is to counter this unintentionally subversive tendency that this note has been written, for those who suggest such action clearly do not appreciate what such changes involve in relation to the past literature. Work has now been recommenced towards the clarification of the actual vice-county boundaries, and it is hoped that it will be possible to make a definite statement of them without too much delay. Meanwhile it is hoped that the suggested alterations will be dropped, and the following subdivisions concerning two recent proposals are suggested as in agreement with the past system of records.

Vice-counties 86, 87, 99 (see *Glasgow Naturalist*, ix, 93 : 1931).

86F. Stirling; Forth drainage area.
86K. Stirling; Kelvin drainage area.
86L. Stirling; Loch Lomond drainage area.
87F. West Perth; Forth drainage area.
87C. West Perth; Clyde (or Falloch) drainage area.

The treatment of Dumbarton and its isolated portion is at present a matter for investigation and discussion. Watson's map appears to include the isolated portion in the North West Lowlands province as part of Lanark, whereas the Glasgow botanists place it in Stirling (as 86A). No decision should be taken until Watson's original MSS. of *Topographical Botany* have been searched for any records from the detached portion which would show how he dealt with the area, for the map, prepared for another work, cannot by itself be taken as settling the matter. Meanwhile, records from the detached portion should be kept separate until an agreed settlement is reached (? as 77D).

Vice-county 103 (see *Nature*, cxlvii, 134 : 1941; and *Proc. Univ. Durham Phil. Soc.*, x, 275 : 1941).

103W. Coll, Tiree and Gunna instead of the suggested "110B".
103M. Mull, etc. (103 exclusive of 103B).

The vice-county system is concerned with the collection of the records and not with the scientific results obtained from their study. If this kind of subdivision *of the original vice-counties* be made, the data obtained can be compared as easily as by any contrary method. Another point which is lost sight of by those advocating the changes is that the original boundaries were known to be entirely arbitrary and never in any special way related to any natural lines of distribution; there is therefore no point whatever in trying to make this or that boundary a natural one. No advantage is therefore gained by changing the original boundaries and a very great deal, as has been pointed out, is lost.

A BOTANICAL HOTEL.

J. Edward Lousley.

In time of war, when travel is almost impossible and so many areas "prohibited," when life tends to become monotonous, and those happy care-free days of unrestricted botanising seem so very distant (perhaps never to return), it is pleasant to reflect on far-away pre-war haunts. Memories of past excursions often centre round the places at which we slept and fed, and I find that my own thoughts more often revert to short leisurely evening strolls in the neighbourhood of hotels than to the more hurried and strenuous excursions to remote hills and lochs.

The hotels at Lawers, Clova, Sligachan, Killin and Inchnadampf, at Maelog, Austwick, Symond's Yat, Langdon Beck, Thetford and Alfriston, at Kenmare, Dingle and Renvyle (that oasis of comfort after days of Irish "eggs and bacon"!) come crowding to the mind for the treasures within range of an easy walk. High Force can produce rarities within its own grounds, but I know of only one hotel which can boast a list of interesting plants which grow actually upon its own walls.

The Star Castle Hotel on St Mary's, in the Isles of Scilly, was built in 1593 as part of the defences to forestall any attempt by Spain to stage another attack after the defeat of the Armada by Drake. Its solid walls have withstood several attacks and after a period as the centre of government of the islands it has now been converted into the most southerly and most westerly hotel in England.

The visitor enters the Castle by a stone bridge over the moat and here, in the crevices of the lichened masonry of the bridge, grow *Cochlearia danica*, *Erodium maritimum*, *Linaria Cymbalaria*, and *Plantago Coronopus*. The entrance way then continues through a cobbled passage with stone walls lined with dark green *Asplenium marinum* and *Cotyledon Umbilicus-Veneris*.

On the top of the broad ramparts (which serve as an open air passage to some of the bedrooms in the guard-rooms) there is a more varied flora in which the Leguminosae are conspicuous. Great mats of *Trigonella ornithopodioides* are intermixed with *Trifolium scabrum*. *Lotus corniculatus* and the rarer *Lotus hispidus* mingle with *Medicago maculata*, *Sagina ciliata* and *Sagina maritima*. On the outer walls *Silene maritima* still grows in the station noted by Townsend in 1864, associated with *Parietaria diffusa*.

The Star Castle stands on the highest part of a promontory known as the "Hugh," round the entire circuit of which run the outer defences built in 1742. Within the area so enclosed grow many other plants which are not properly the subject of this note, but it may be permissible to include *Ranunculus muricatus*, *Silene anglica* and *S. gallica* which flourish as weeds in the hotel's flower garden. None of the species mentioned are of great rarity, but such a flora growing on an English building used as a hotel must surely be unique!

THE PIONEER FLORA OF BOMBED SITES IN CENTRAL LONDON.

J. Edward Lousley.

The destruction by enemy bombs of large areas in Central London has provided an exceptional opportunity of studying the recolonisation of habitats which were botanically almost completely sterile. The " bare area " so often postulated by writers on ecology as the place colonised by the first stage of a plant succession, and so very rarely to be seen in this country, would appear to be attained on a large scale as a result of the bombing. Viable seeds of phanerogams are unlikely to exist in large numbers in the mortar and brickwork of the old buildings destroyed, though algae and bryophytes doubtless grew on their walls and roofs. Thus by making a survey of the sites of buildings destroyed in the air-raids we may feel confident that the phanerogams listed have arrived since the date of the destruction.

The sites discussed in this paper, twenty-one in all, are in densely built-up areas of the City, Holborn, and by the main road which runs south from London Bridge through Borough High Street and the Elephant and Castle to North Kennington. They were damaged between September 7, 1940, and May 11, 1941—in most cases on the nights of December 29, 1940, and May 10, 1941. Great care was taken to make records only from places which were known to have been completely built over, such as restaurants, banks, churches and shops with which I was familiar before the war.

The extent to which even the extremely valuable land of the " square mile " of the City of London contained places where weeds might flourish is probably not fully appreciated even by Londoners. In the alleys and courts, behind the mighty façade of enormous blocks of offices and shops, many disused and often neglected churchyards, " squares," backyards, and even pleasant gardens, harboured plants which were seldom to be seen by the casual enquirer. Some of these species are somewhat unexpected. For example, on the mediaeval masonry of the short length of so-called " Roman Wall " opposite St Alphage, the Pellitory-on-the-Wall (*Parietaria diffusa* M. & K.) has flourished for several years. It may well have been originally planted there, but the other species such as *Cirsium vulgare* (Savi) Airy Shaw with which it is accompanied, and which also survive the surrounding desolation, have certainly not been deliberately introduced. The care which has been taken in the selection of the sites for observation makes it certain that any such pre-war floras have been excluded even though their habitats may now be indistinguishable from surrounding cleared areas.

For about a year after the heavy air-raids very little phanerogamic vegetation appeared on the tumbled masses of masonry and brickwork, doubtless because of the absence of suitable soil in the crevices. Under such conditions *Epilobium angustifolium* was the only species which occurred at all frequently. Its most surprising achievement to come under my observation occurred near the Elephant and Castle, where the plant flowered in the summer of 1941 on the stump of the wall of a building destroyed the previous autumn. Seed must have arrived and germinated very shortly after the damage took place. The three Senecios—*S. squalidus*, *S. viscosus* and *S. vulgaris*, all with wind-borne fruits, were almost the only other species to arrive in 1941.

Clearance and levelling of the sites exposed much soft rubble and dust which provided favourable conditions for many additional species. These included a number of species with wind-borne fruits such as *Epilobium angustifolium*, *Erigeron canadensis*, *Tussilago Farfara*, *Senecio squalidus*, *S. viscosus*, *S. vulgaris*, and *Sonchus oleraceus*. Others whose fruits probably arrived on the wheels of lorries and carts engaged on removing the debris, or on the boots of the workmen, may include:—*Capsella Bursa-pastoris*, *Cerastium vulgatum*, *Stellaria media*, *Plantago major*, *Chenopodium album*, *Polygonum Persicaria*, *P. heterophyllum*, *Rumex crispus* and *R. obtusifolius*. Finally four plants, *Trifolium pratense*, *T. hybridum*, *Lolium perenne* and *L. multiflorum*, almost certainly came in the nosebags of the horses engaged in the work.

The small ruined 15th century church of St Olave's, Hart Street, Crutched Friars, is of exceptional interest. William Turner, the "Father of English Botany" and author of a famous Herbal, was buried in the south aisle of this church on July 9, 1568, where there is an inscription to his memory. Enemy action has brought down the roof and upper walls, and access to the interior is impossible, but from the road *Epilobium angustifolium*, *Tussilago Farfara*, *Senecio vulgaris* and *Sonchus oleraceus* may be seen growing in the north aisle. St Mary's Church, Kennington Park Road, is a larger modern church which has been less seriously damaged by the bombing. Access is again not possible, but inspection through a crack in the charred door showed a most luxuriant vegetation growing in the pavement of the aisles, in which *Epilobium angustifolium* was the dominant species.

The extent to which the invading flora could endure shade was often surprising. For example, a small shop in Newington Causeway was damaged and left unused. Three of the walls were intact and the ceiling though sagging appeared to be water-tight; only the shop front was missing.. Towards the back of the shop, behind the ruined counter, several plants of *Tussilago Farfara* and *Senecio vulgaris* were growing under dimmer, drier conditions than one would have supposed possible.

The lists on which this paper is based were all made in the last fortnight of October 1942, at a time when most of the sites had only been cleared for a few months and others were still uncleared. As might be expected the pioneer vegetation was very scanty, averaging only about four species to each locality. The two richest places will illustrate the comparative frequency of species:—

(1) Site in Fenchurch Street, near Mark Lane.

Senecio vulgaris—abundant.
Poa annua—abundant.

Erigeron canadensis—frequent.
Capsella Bursa-pastoris—a few plants.
Matricaria inodora—a few very young plants.
Senecio squalidus—one small plant.
Galinsoga parviflora—one small plant.

(2) Site formerly occupied by "Isaac Walton's" shop, Newington Causeway.
Senecio vulgaris—abundant.
Epilobium angustifolium—abundant.
Poa annua—abundant.
Senecio viscosus—common.
Tussilago Farfara—frequent.
Sonchus oleraceus—several plants.
Polygonum Persicaria—one plant.
Plantago major—one plant.

Observations in the West End of London suggest that pioneer colonists there usually comprised the same species. In the suburbs the range of invading species was much wider owing to the proximity of numerous gardens and other open ground. The purpose of this paper is to record the pioneer flora of bombed sites in Central London in 1942. There can be little doubt that in 1943 a richer and more luxuriant flora will appear.

Species observed as pioneer colonists on 21 bombed sites in the City of London and adjacent districts in October 1942.

59/1. CAPSELLA BURSA-PASTORIS Weber—Fenchurch Street only.
100/5. CERASTIUM VULGATUM L.—Minories only.
101/3. STELLARIA MEDIA Vill.—Borough High Street only.
155/2. TRIFOLIUM PRATENSE L.—Ludgate Hill and Borough High Street only.
155/15. T. HYBRIDUM L.—Fenchurch Street only.
220/1. EPILOBIUM ANGUSTIFOLIUM L.—Abundant, 11 sites.
320/3. ERIGERON CANADENSIS L.—Locally abundant, 3 sites. This species now occurs in great quantity in many parts of London and became more frequent in the central area when earth-covered air-raid shelters were constructed. It may be expected to cover many of the damaged sites in a short time.
354/1. GALINSOGA PARVIFLORA Cav.—One small plant, Fenchurch Street. It occurs in greater quantity on the bombed sites of the West End.
371/1. MATRICARIA INODORA L.—Fenchurch Street only.
378/3. ARTEMISIA VULGARIS L.—Chiswell Street only.
379/1. TUSSILAGO FARFARA L.—11 sites, very abundant. This species has long been common on railway embankments well into London, and the trains may well have brought the pappused fruits in the vortex in their rear.

383/7. SENECIO SQUALIDUS L.—High Holborn, Borough, London Wall and Fenchurch Street. This species is common in the suburbs of London; the burned out ruins of the City will probably prove to its liking.
383/8. S. VISCOSUS L.—8 sites, including Ludgate Hill, Holborn, Borough High Street, and Elephant and Castle. In recent years this plant has greatly increased in the southern suburbs.
383/10. S. VULGARIS L.—17 sites. By far the most common and abundant species, and usually the first to arrive.
396/2. CIRSIUM VULGARE (Savi) Airy Shaw—High Holborn only. (The London Wall station is not the site of a bombed building.)
396/8. C. ARVENSE (L.) Scop.—High Holborn only.
427/4. SONCHUS OLERACEUS L.—4 sites.
588/10. PLANTAGO MAJOR L.—Newington Causeway, a single plant.
600/8. CHENOPODIUM ALBUM L.—High Holborn, a few plants.
615/7. POLYGONUM PERSICARIA L.—Newington Causeway only.
615/14. P. HETEROPHYLLUM Lindm.—High Holborn only.
618/3. RUMEX CRISPUS L.—Ludgate Hill and Chiswell Street only.
618/6. R. OBTUSIFOLIUS L. Newington Butts and Minories only.
824/14. POA ANNUA L.—7 sites, often in quantity.
829/1. LOLIUM PERENNE L.—Ludgate Hill, Minories and Chiswell Street.
829/4. L. MULTIFLORUM Lam.—St Bride's Street.

There were 88 records, of 27 species, from 21 bombed sites selected as known to have been completely built over before the war.

STAFFORDSHIRE ADDITIONS TO THE COMITAL FLORA.

E. S. Edees, M.A.

The literature of Staffordshire botany contains many plants which are not recorded for v.-c. 39 in the *Comital Flora*. These are brought together in the present paper.

Some of the plants recorded below have not been seen for many years and may now be extinct. But where there is good evidence that a plant did once exist in the county, I think it should be included within brackets in the *Comital Flora*.

Aliens are marked with a dagger and plants which seem to have been wrongly named are appended in a separate list.

The following abbreviations are used:—

T.N.S.F.C.—The Transactions of the North Staffordshire Field Club.

Shaw, 1798.—The History and Antiquities of Staffordshire, by Stebbing Shaw. Vol. I contains a long list of plants contributed by the Rev. Samuel Dickenson. Vol. II contains a few additional records by other botanists.

Garner, 1844.—The Natural History of the County of Stafford, 1844, and *Supplement*, 1860, by R. Garner.

Brown, 1863.—The Natural History of Tutbury, by Sir O. Mosley and E. Brown.

Edwardes, 1876.—" List of Plants found near Denstone in 1876," by the Rev. D. Edwardes in *T.N.S.F.C.*, xi, 51, 1877.

Garner, 1878.—" The Staffordshire Flora," by R. Garner in *T.N.S.F.C.*, xii, 95, 1878.

Purchas, 1885.—" Some More Notes on Dovedale Plants," by the Rev. W. H. Purchas in the *Journal of Botany*, xxiii, 181, 1885.

Painter, 1892.—" List of Plants found within Five Miles of Biddulph Church, 1885-92," by the Rev. W. H. Painter in *T.N.S.F.C.*, xxxi, 74, 1897.

Burton Flora, 1901.—" The Flora of Burton-on-Trent and Neighbourhood," published in the *Transactions of the Burton-on-Trent Natural History and Archaeological Society*, 1896-1901.

Bagnall, 1901.—" The Flora of Staffordshire," by J. E. Bagnall, published as a Supplement to the *Journal of Botany*, 1901.

Berrisford and Walker, 1906.—" Plants found on the Railway Embankment at Oakamoor," by S. Berrisford and A. Walker in *T.N.S.F.C.*, xl, 73, 1906.

Reader, 1923.—" The Flora of Hawkesyard," by the Rev. H. P. Reader in *T.N.S.F.C.*, lvii, 105, 1923.

Reader, 1924.—" The Saline Flora of Staffordshire," by the Rev. H. P. Reader in the *Journal of Botany*, lxi, 278, 1923, and in *T.N.S.F.C.*, lviii, 40, 1924.

Ridge, 1929.—" The Flora of North Staffordshire," by W. T. Boydon Ridge, published as an Appendix to the *T.N.S.F.C.*, 1922-9.

B.E.C. Rep.—*The Report of the Botanical Society and Exchange Club of the British Isles.* I have not worked systematically through all the volumes in this series and there may well be some Staffordshire records in them which have been overlooked.

Curtis, 1930.—" Adventive Flora of Burton-upon-Trent," by Sir R. *Curtis* in *B.E.C. 1930 Rep.*, 465 (1931).

2/2. *Thalictrum minus* L. Weaver Hills, Pickard in *T.N.S.F.C.*, lx, 155, 1926. " The specimens were few in number and small."

21/4. *Papaver Lecoqii* Lam. Mill Dale near Alstonfield, Purchas in *Bagnall, 1901.* Bagnall approved the record.

32/1. *Fumaria capreolata* L. Canal side, Shobnall, *Brown, 1863*; Stafford, Moore in *T.N.S.F.C.*, xxxi, 76, 1897; Burton, Mason in *Burton Flora, 1901*; found on a wall at Stanton, Copeland in *T.N.S.F.C.*, lvii, 132, 1923. I do not know how far these records are reliable. Garner describes the species as frequent. Bagnall questions this and considers the Shobnall record of Brown " probably a rampant form of *F. officinalis.*" Ridge approved Moore's Stafford record.

32/5. *F. Boraei* Jord. Hedges by road to Rugeley, by canal towing path, *Reader, 1923.*

32/11. *F. micrantha* Lag. Found occasionally, *Brown, 1863.*

†32/13. *F. parviflora* Lam. Burton, J. E. Lousley, R. C. L. Burges, W. H. Hardaker and C. Thomas in *B.E.C. 1936 Rep.*, 238 (1937). Det. H. W. Pugsley. " Abnormal alien plants."

†36/2. *Barbarea verna* (L.) Asch. Near Stoke, *Garner, 1844*; Burton, quoted by *Garner, 1844*; railway embankment at Oakamoor, *Berrisford and Walker, 1906.*

36/4. *B. arcuata* (Presl) Rchb. Burton, Druce in *B.E.C. 1929 Rep.*, 102 (1930).

†52/1. *Camelina sativa* Crantz. Recorded for several different places by Shaw, Garner, Bagnall and Ridge.

[88/14. *Viola contempta* Jord. " Gobaldisham Heath, E. Vachell " in *B.E.C. 1930 Rep.*, 459 (1931). Det. E. Drabble. (An error; the specimen in Herb. Drabble is labelled " Suffolk " by Drabble, and the plant came from Garboldisham Heath in Norfolk.—Ed.)]

*88/22. *V. agrestis* Jord. Specimens from Ashley and Betley have been determined by Mrs E. Drabble.

*88/23. *V. segetalis* Jord. Swynnerton. Det. Mrs E. Drabble.

*88/24. *V. segetalis* Jord. f. *obtusifolia* (Jord.) Drabble. Audley, Madeley, Balterley. Det. Mrs E. Drabble.

88/31. *V. lepida* Jord. Abundant in some parts of the Manifold Valley, E. S. Edees in *T.N.S.F.C.*, lxxiii, 50, 1939. Det. P. M. Hall.

†100/9. *Cerastium tetrandrum* Curt. Stafford, Spark in *Bagnall, 1901.* Garner says "not rare in waste places." This is difficult to understand. I have seen the plant once, a few specimens on the platform of Cliffe Park station in the parish of Rushton. *T.N.S.F.C.*, lxxvi, 24, 1942.

102/6. *Arenaria leptoclados* (Rchb.) Guss. Codsall, Coldrick Wood and Arley Wood, *Bagnall, 1901*; Mavesyn Ridware, *Reader, 1923*; Manifold Valley, *Ridge, 1929.*

†108/2. *Claytonia perfoliata* Donn. Endon, Edwardes in *Garner, 1878*; abundant in a field at Perry, *Bagnall, 1901*; Stableford, Ridge in *T.N.S.F.C.*, xlii, 88, 1908; Caverswall, *Ridge, 1929*; *Burston,* G. J. V. Bemrose in *T.N.S.F.C.*, lxxv, 16, 1941.

†115/2. *Althaea hirsuta* L. Burton, Sir R. Curtis in *B.E.C. 1931 Rep.*, 639 (1932).

†123/1. *Tilia platyphyllos* Scop. Planted about Burton, Gibbs in *Burton Flora, 1901*; Madeley, Daltry in a letter to *Ridge, 1929.*

†128/2. *Erodium moschatum* (L.) L'Hérit. Several old records quoted by *Garner, 1844*; Bishop's Wood near Eccleshall, *T.N.S.F.C.*, xxv, 32, 1891; railway embankment at Oakamoor, *Berrisford and Walker, 1906.*

†133/2. *Impatiens biflora* Walt. In the canal at Great Haywood, P. P. Thornton in *T.N.S.F.C.*, lxxvi, 25, 1942.

†133/3. *I. parviflora* DC. Lichfield, Sir R. Curtis in *B.E.C. 1931 Rep.*, 640 (1932).

†155/4. *Trifolium incarnatum* L. Barlaston, *Garner, 1844*; occasionally found after cultivation, *Brown, 1863*; Denstone, *Edwardes, 1876*; Audley, G. J. V. Bemrose in *T.N.S.F.C.*, lxvii, 84, 1933.

†160/8. *Lotus angustissimus* L. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Burton, Druce in *B.E.C. 1926 Rep.*, 22 (1927).

†170/1. *Coronilla varia* L. Burton, *Curtis, 1930.*

183/4. *Prunus Cerasus* L. There are several records for this species, but it has probably been confused with *P. avium* L. Garner and others who record *P. Cerasus* in lists make no mention of *P. avium*, which is certainly our common wild cherry.

†183/5. *P. domestica* L. Hawkesyard Park, *Reader, 1923.*

†184/10. *Spiraea salicifolia* L. Needwood and Cannock Chase, quoted by *Garner, 1844*; hedge on hill above Bentley Farm (Mrs E. Reynolds, 1848), quoted by *Reader, 1923*; Trentham, *Ridge, 1929*.

187/2×1. ×*Geum intermedium* Willd. Kingston, *Bagnall, 1901*; between Ellastone and Stanton, Deacon and Ridge in *T.N.S.F.C.*, l, 134, 1916; Madeley, Daltry in *T.N.S.F.C.*, l, 135, 1916.

†188/1. *Fragaria moschata* Duchesne. Branston, near the Trent, *Brown, 1863*.

†193/2. *Poterium polygamum* W. & K. Whittington Heath, Fraser in *Bagnall, 1901*.

194/14. *Rosa micrantha* Sm. Lane from Hill Ridware to Rugeley (Mrs E. Reynolds, 1848), quoted by *Reader, 1923*, who saw a specimen; Oakamoor, near Cotton, Teddesley, *Bagnall, 1901*.

194/21. *R. villosa* L. Recorded for several different places by Garner, Bagnall, Reader and Ridge.

†195/9. *Pyrus intermedia* Ehrh. Arley Dingle, *Bagnall, 1901*.

195/11. *P. rupicola* Syme. Dovedale, Fraser in *Bagnall, 1901*. Bagnall approved the record. See also *Purchas, 1885*.

†195/16. *P. germanica* (L.) Hook. fil. Stoke, Garner in *T.N.S.F.C.*, xiii, 89, 1879.

196/2. *Crataegus oxyacanthoides* Thuill. Coton-in-the-Clay, near Hanbury, two or three trees between Great Haywood and Farley, Barton-under-Needwood, Little Aston, Kinver, Arley, *Bagnall, 1901*; Burton, Painter in *Burton Flora, 1901*; near Weston, *Ridge, 1929*. A recent specimen from Newcastle has been determined at the British Museum by S. B. Batko.

†199/24. *Saxifraga umbrosa* L. Belmont Woods in 1837, rocky dell below Upper Cotton, *Garner, 1844*; neither of these there in 1897, *Bagnall, 1901*; Denstone, *Edwardes, 1876*; Marsh Hill near Stockton Brook, Ridge in *T.N.S.F.C.*, xlvii, 96, 1913.

†211/3. *Sedum reflexum* L. Tutbury Castle, Biddulph Hall, Croxden Abbey, Burton Abbey, *Garner, 1844*. The record for Biddulph Hall is confirmed by *Painter, 1892*, and by *Ridge, 1929*. Stapenhill, *Brown, 1863*; Barton, Gisborne in *Burton Flora, 1901*.

216/1. *Myriophyllum spicatum* L. There are several records by Shaw, Garner, Bagnall, Reader and Ridge.

216/3. *M. verticillatum* L. Forton, *Shaw, 1798*; Aqualate Mere, quoted by *Garner, 1844*; Kingston, Perton, *Bagnall, 1901*.

225/3. *Circaea alpina* L. Remove brackets. There are several records in Garner, Bagnall and Ridge.

†240/1. *Astrantia major* L. Burton, Sir R. Curtis in *B.E.C. 1926 Rep.*, 115 (1927).

†250/1. *Carum Carvi* L. Wolverhampton, Endon, Newcastle, *Garner, 1844*; railway embankment at Oakamoor, *Berrisford and Walker, 1906.*

†250/3. *C. Petroselinum* (L.) B. & H. Croxden Abbey walls, *Garner, 1844.*

†276/5. *Peucedanum Ostruthium* (L.) Koch. Endon, Baddeley Edge, Axe Edge, between Calton Moor House and Mayfield, *Garner, 1844*; Bagnall, *T.N.S.F.C.*, iv, 5, 1870.

†283/2. *Caucalis daucoides* L. Burton, J. E. Nowers in *Burton Flora, 1901*; railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Burton, Druce in *B.E.C. 1928 Rep.*, 740 (1929).

†283/8. *C. latifolia* L. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; railway embankment at Rocester, Melford in *T.N.S.F.C.*, xlii, 86, 1908.

†291/1. *Lonicera Caprifolium* L. Gardens and hedges, but introduced, *Brown, 1863*; near Denstone, Goodall in *T.N.S.F.C.*, xvi, 78, 1882; Sinai Park, Mason in *Burton Flora, 1901*; between Cheadle and Oakamoor, *Ridge, 1929.*

†291/5. *L. Xylosteum* L. Needwood Forest, Hewgill in *Garner, 1844*; Sinai Park, *Brown, 1863*; Knypersley Hall, *Painter, 1892*; Trysull Dingle, Fraser in *Bagnall, 1901*; Belmont Woods, *Ridge, 1929.*

†296/10. *Galium tricorne* Stokes. Denstone, *Edwardes, 1876*; railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Burton, Druce in *B.E.C. 1928 Rep.*, 740 (1929).

†296/12. *Galium spurium* L. var. *Vaillantii* DC. Burton, J. E. Lousley, R. C. L. Burges, W. H. Hardaker and C. Thomas in *B.E.C. 1936 Rep.*, 260 (1937).

301/1. *Valeriana officinalis* L. Bagnall describes this species as rare in Staffordshire and gives only three records, two of them on the authority of C. Bailey. Ridge increases the number with several of his own. A specimen gathered by myself in the Manifold Valley was determined by B. L. Burtt as " what Drabble would have called *V. angustifolia* Host."

†302/1. *Kentranthus ruber* (L.) Dr. Old walls at Burton, *Garner, 1844.* Approved by Ridge.

318/19. *Aster Tripolium* L. There are old records for Branston, Tixall, Shirleywich, Ingestre and even for Stoke, but the plant was not seen by Reader in 1923 and may now be extinct. The following description from Cox's *Staffordshire*, 1738, is worth quoting: " The lesser Sea Starwort, thought only to grow by the Sea Shore, and delighting in Salt-water; yet found in this Inland County, 50 Miles from the Sea, at Ingestre, about two Miles from Stafford; but not out of its natural Aboad, for it grows in a marsh, where a Salt Water breaks out and frets away the Grass." The substance of this is taken from Plot's *Natural History of Staffordshire*, 1686.

†381/1. *Doronicum Pardalianches* L. There are about a dozen records, old and new, and most of the old ones are confirmed by Ridge. My record for Ashley, quoted in *B.E.C. 1939-40 Rep.*, 283 (1942), is not an N.C.R.

†383/1. *Senecio sarracenicus* L. Near Compton Mill, Bradwell, Needwood Forest, quoted by *Garner, 1844*. Garner looked in vain for this plant at Bradwell, but found it at the neighbouring Wolstanton, *Garner, 1878*.

†383/7. *S. squalidus* L. Found in great quantity on the slag heaps near Walsall, Bentley Common, Ocker Hill and Tipton, to which it had spread from the adjoining railway. Also seen near the Wren's Nest and on the top of Dudley Castle.—Druce in *B.E.C. 1923 Rep.*, 190 (1924); Brindley Ford, G. J. V. Bemrose in *T.N.S.F.C.*, lxvi, 159, 1932; near railway between Birmingham and Wolverhampton, R. C. L. Burges in *B.E.C. 1932 Rep.*, 104 (1933); Madeley, G. J. V. Bemrose in *T.N.S.F.C.*, lxxv, 17, 1941.

†383/8. *S. viscosus* L. Garner describes this plant as common. Bagnall says he never saw it in Staffordshire. Ridge found it at Bucknall and Burslem. It is now an abundant species on waste ground in the Potteries area. [Burton, Druce and Curtis in *B.E.C. 1926 Rep.*, 118 (1927), as N.C.R.—Ed.]

393/1. *Arctium Lappa* L. (=*A. majus* Bernh.). Kingston and Wren's Nest, *Bagnall, 1901* [*in Top. Bot.. Suppl. I*, 1905.—Ed.]; [*B.E.C. 1918 Rep.*. 384 (1919). "*Ridge Rep.*, 1917."—Ed.]; Kidsgrove and Manifold Valley, *Ridge, 1929*.

†395/3(2). *Carduus tenuiflorus* Curt. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Burton, Druce in *B.E.C. 1928 Rep.*, 743 (1929).

†399/1. *Silybum Marianum* (L.) Gaertn. Alton, Stone, Burton, *Garner, 1844*; Walton, Shobnall, *Brown, 1863*; railway cutting near Rugeley in 1897, *Bagnall, 1901*; Burton, Druce in *B.E.C. 1928 Rep.*, 744 (1929).

†405/15. *Centaurea Calcitrapa* L. Burton, *Curtis, 1930*.

†419/8. *Hieracium brunneocroceum* Pugsl. Lichfield, Druce and Sir R. Curtis in *B.E.C. 1923 Rep.*, 193 (1924). There are several records for *H. aurantiacum* L. The plant

is well established on the railway embankment between Endon and Stockton Brook, where it was first recorded by *Ridge, 1929*. Specimens from this and other Staffordshire localities appear to be *H. brunneocroceum*.

466/1. *Glaux maritima* L. Salt-marsh near Tixall, *Shaw, 1798*. Re-discovered by Reader in 1923, *Reader, 1924*.

468/1. *Centunculus minimus* L. A mile from Stafford, note in Garner's interleaved copy of the *Natural History of the County of Stafford*; Balterley, Writtle in *Garner, 1878*; Blithfield, quoted by *Bagnall, 1901* [in *Top. Bot., Suppl. I*, 1905.—Ed.]

482/1. *Nymphoides orbiculata* Gilib. Pool at Alton, *Garner, 1844*.

†503/1. *Pulmonaria officinalis* L. Needwood Forest, Hewgill in *Garner, 1844*; as an escape from cultivation at Consall, *Ridge, 1929*.

†503/2. *P. longifolia* Boreau. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; *Consall, Ridge, 1929*.

†507/2. *Lithospermum purpureo-caeruleum* L. Burton, *Curtis, 1930*; rubbish tip, Burton, Burges in *B.E.C. 1933 Rep.*, 534 (1934).

†527/5. *Verbascum Blattaria* L. Near Quinton's Orchard Farm (Mrs Reynolds, 1848), *Reader, 1923*; Hill Ridware, *Shaw, 1798*; Durnsley and Kinver, Scott in Purton's *Midland Flora*, 1820.

†542/17. *Veronica triphyllos* L. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*.

558/1. *Mentha rotundifolia* (L.) Huds. Hedge near Sudbury station, Ridge in *T.N.S.F.C.*, li, 108, 1917 (*B.E.C. 1918 Rep.*, 393 (1919)); roadside between Froghall and Cheadle, Blake in *T.N.S.F.C.*, liv, 108, 1920.

558/4. *M. spicata* Huds. Heleigh Castle, *Garner, 1844*; near Needwood Forest, *Ridge, 1929*.

558/10. *M. gentilis* L. Lane from Blithbury towards Bentley Farm, *Reader, 1923*.

588/5. *Plantago maritima* L. Fairly plentiful near Tixall, *Reader, 1924*.

†600/12. *Chenopodium ficifolium* Sm. Burton, *Curtis, 1930*.

†613/1. *Salsola Kali* L. Burton, Druce in *B.E.C. 1928 Rep.*, 756 (1929).

†618/2. *Rumex longifolius* DC. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Burton, Druce in *B.E.C. 1932 Rep.*, 109 (1933).

†622/1. *Aristolochia Clematitis* L. Wolstanton, *Garner, 1878*.

†631/1. *Buxus sempervirens* L. Plantations, *Brown, 1863*; occurs occasionally as an escape, *Ridge, 1929*.

†632/2. *Mercurialis annua* L. Burton, Druce in *B.E.C. 1927 Rep.*, 417 (1928), *Curtis, 1930.*

642/2. *Betula pubescens* Ehrh. Five records in *Bagnall, 1901*, who considers it frequent but not properly discriminated from *B. alba* L. Ridge says that both species are common.

†647/1. *Castanea sativa* Mill. Frequent as a planted tree.

651/3. *Populus nigra* L. There are several records in *Bagnall, 1901*, but this tree has not been distinguished in Staffordshire from *P. deltoidea* Marsh. var. *serotina* (Hartig) except by *Reader, 1923*, who gives " near the Blithe, Hamstall Ridware " for *P. nigra* and " introduced and abundant " for *P. monilifera* [near Harford, Druce, *B.E.C. 1919 Rep.*, 680 (1920).—Ed.]

669/6. *Orchis latifolia* L. var. *pulchella* (Druce) Pugsl. Stanton, E. S. Edees in *T.N.S.F.C.*, lxxiii, 52, 1939. Det. P. M. Hall.

672/5. *Ophrys muscifera* Huds. Denstone, *Edwardes, 1876*; Dovedale, very sparingly, *Purchas, 1885.* I once found a few plants in the Hamps Valley, but have not seen them there since (*T.N.S.F.C.*, lxxiii, 53, 1939).

†675/1. *Cypripedium Calceolus* L. Found in a field growing wild near Hoar Cross; doubtless planted there, Sir R. Curtis in *B.E.C. 1928 Rep.*, 761 (1929).

†678/2. *Crocus vernus* (L.) All. Occasionally in the Trent meadows near Burton, *Brown, 1863*; Alton, Goodall in *T.N.S.F.C.*, xvi, 77, 1882.

707/2. *Ornithogalum umbellatum* L. Tixall, Bostock in *T.N.S.F.C.*, xxxv, 69, 1901.

†710/1. *Tulipa sylvestris* L. Near Statfold Hall, *Garner, 1844*; near Alton in a place once used as a marl pit. Ridge in *T.N.S.F.C.*, lix, 159, 1925 (*B.E.C. 1925 Rep.*, 898 (1926)), " The tenant of an adjacent cottage has known of the existence of this plant here for the last fifty years, so that it seems well established."

718/14. *Juncus compressus* Jacq. Garner describes this as common, but gives no localities. Canal bank, Shobnall, and roadside between Tutbury and Burton, *Brown, 1863.*

718/15. *J. Gerardi* Lois. Branston, near the Trent, *Brown, 1863*; Branston Salt Marsh, J. E. Nowers and J. G. Wells in *Burton Flora, 1901*; re-discovered in a salt marsh at Kingston by Reader in 1923. " Also very fine by ditches near Tixall, with long bracts recalling *compressus*, but with the characteristic oblong capsules almost or quite enclosed in the perianth," *Reader, 1924.* The Kingston record was confirmed by Druce.

722/4. *Sparganium angustifolium* Michx. Aqualate, *Shaw, 1798;* Whitmore, *Garner, 1844;* Codsall, Fraser in *Bagnall, 1901.*

746/4. *Scirpus Tabernaemontani* Gmel. Shirleywich, *Garner, 1844,* confirmed by *Reader, 1924;* Branston Meadows, *Brown, 1863;* Branston Salt Marsh, J. E. Nowers and J. G. Wells in *Burton Flora, 1901;* Oulton, abundant, *Bagnall, 1901;* pool in wood, King's Bromley, *Reader, 1923;* Aqualate, Druce in *B.E.C. 1925 Rep.*, 900 (1926).

753/17. *Carex distans* L. Weaver Hills, Blymhill, *Shaw, 1798.* These two records are probably errors, but there is a safe record for Shirleywich, *Reader, 1924.* " Very fine in a marshy hollow."

753/22. *C. viridula* Michx. Byrkley Park and Moira, Coleman in *Brown 1863;* Needwood Forest, *Brown, 1863;* Tixall Heath and Oulton, *Bagnall, 1901.*

†780/1. *Agrostis verticillata* Vill. Burton, Druce in *B.E.C. 1928 Rep.*, 765 (1929).

826/3. *Festuca arundinacea* Schreb. There are two records in *Brown, 1863,* but these may be for what we now call *F. elatior* L. A specimen gathered from the canal side at Milton in the Potteries area in 1936 was determined by Dr W. O. Howarth as *F. elatior* L. subsp. *arundinacea* var. *genuina* subvar. *vulgaris.* See *B.E.C. 1936 Rep.*, 416 (1937).

†827/20. *Bromus molliformis* Lloyd. Burton, J. P. M. Brenan and J. F. G. Chapple in *B.E.C. 1937 Rep.*, 520 (1938). Det. C. E. Hubbard.

†827/22. *B. arvensis* L. Denstone, *Edwardes, 1876.* Burton, Druce and Sir R. Curtis in *B.E.C. 1926 Rep.*, 142 (1927).

827/19(2). *B. lepidus* Holmberg. Near Cresswell, E. S. Edees in *T.N.S.F.C.*, lxxiv, 45, 1940. Det. W. O. Howarth.

†835/3. *Hordeum marinum* Huds. Burton, Druce and Sir R. Curtis in *B.E.C. 1926 Rep.*, 143 (1927).

†839/1. *Juniperus communis* L. Old trees frequent about very ancient houses, *Garner, 1844.* Ridge approves this statement.

856/5. *Dryopteris aemula* Kuntze. Cheadle, Blagg in *T.N.S.F.C.*, xliii, 106, 1909.

876/5. *Chara hispida* L. Betley and Aqualate, plentiful, *Garner, 1844.*

APPENDIX OF SUPPOSED ERRORS.

The following plants have also been recorded for Staffordshire, but all the records are old and unconfirmed. Some of these plants may have occurred as aliens, but most of them have probably been wrongly named.

87/4. *Helianthemum canum* (L.) Baumg. Weaver Hills, Shaw in *Garner, 1844.* " Probably *H. vulgare* was intended," *Garner, 1878.*

96/6. *Silene quinquevulnera* L. *Garner, 1878.*

115/1. *Althaea officinalis* L. Denstone, *Edwardes, 1876.*

147/2. *Genista pilosa* L. Pendeford, Shaw in *Garner, 1844*

155/19. *Trifolium agrarium* L. Denstone, *Edwardes, 1876.*

178/5. *Lathyrus palustris* L. Denstone, *Edwardes, 1876.*

183/4. *Prunus Cerasus* L. There are several records for this species, but it has probably been confused with *P. avium* L. Garner and others who record *P. Cerasus* in lists make no mention of *P. avium*, which is certainly our common wild cherry.

199/2. *Saxifraga oppositifolia* L. Railway embankment at Oakamoor, *Berrisford and Walker, 1906.*

211/7. *Sedum album* L. Yoxall, Hewgill in *Garner, 1844.*

250/5. *Carum Bulbocastanum* (L.) Koch. Denstone, *Edwardes, 1876.*

265/4. *Oenanthe pimpinelloides* L. Denstone, *Edwardes, 1876.*

296/1. *Galium boreale* L. Cheddleton, Edwardes, quoted by Goodall *in T.N.S.F.C.*, xvi, 77, 1882.

296/3. *G. erectum* Huds. Quoted for Lichfield and Burton by *Garner, 1844.*

304/2. *Valerianella eriocarpa* Desv. Dovedale, Cheadle, Lichfield, quoted by *Garner, 1844.*

320/1. *Erigeron borealis* (Vierh.) Druce. Cheddleton Heath, Miss Wardle in *T.N.S.F.C.*, xl, 172, 1906. A specimen in the herbarium of the Darlington and Teesdale Naturalists' Field Club proves this to have been *E. acer* L.

405/1. *Centaurea Jacea* L. Cradley Park, quoted by *Garner, 1844.*

427/1. *Sonchus palustris* L. Stafford, *Garner, 1844.* Bagnall thought that a large form of *S. arvensis* L. was mistaken for this plant, *Bagnall, 1901.*

435/1. *Campanula glomerata* L. Denstone, *Edwardes, 1876.*

503/2. *Pulmonaria longifolia* Boreau. Railway embankment at Oakamoor, *Berrisford and Walker, 1906*; Consall, *Ridge, 1929.*

509/2. *Echium plantagineum* L. Stoke, Garner in *T.N.S.F.C.*, xiii, 89, 1879.

590/1. *Illecebrum verticillatum* L. Near Ranton, *Garner, 1878.* The same locality or one near to it is mentioned by Withering in his *Systematic Arrangement of British Plants*; " On the road side betwixt Elnal and Ranton Abbey."

606/17. *Atriplex portulacoides* L. Railway embankment at Oakamoor, *Berrisford and Walker, 1906.*

671/1. *Aceras anthropophora* (L.) Br. Madeley, Stanway in *T.N.S.F.C.*, xlii, 88, 1908.

674/3. *Habenaria albida* (L.) R. Br. Hollington, Edwardes, quoted by Goodall in *T.N.S.F.C.*, xvi, 77, 1882.

686/1. *Leucojum vernum* L. Dovedale, quoted by *Garner, 1878.*

718/22. *Juncus biglumis* L. Yarnfield, Massey in *Garner, 1878.*

733/1. *Damasonium Alisma* Mill. Yarnfield, *Garner, Supplement to the Natural History*, 1860.

737/30. *Potamogeton filiformis* Pers. Copmere, Masefield and Bostock in *T.N.S.F.C.*, xxvi, 94, 1892.

753/23. *Carex extensa* Good. Moreton Marsh, Shaw in *Bagnall, 1901.*

753/38. *C. limosa* L. There are several records quoted by *Garner, 1844*, and requoted by *Bagnall, 1901.* But Bagnall considers them " probably a variety of *C. flacca.*"

836/3. *Elymus europaeus* L. Denstone, *Edwardes, 1876.*

863/1. *Hymenophyllum tunbridgense* (L.) Sm. Gradbatch, quoted by *Garner, 1844*, from *The Botanist's Guide.*

876/6. *Chara tomentosa* L. Needwood, *Shaw, 1798.*

A VISIT TO SCALPAY (HARRIS), V.-C. 110.

M. S. Campbell.

In July 1939 I took an expedition to the Outer Hebrides for the purpose of exploring that part of south-west Lewis hitherto more or less unknown botanically. At the conclusion of the visit to Lewis, A. J. Wilmott and E. B. Bangerter accompanied me to Tarbert, to continue investigations in the Isle of Harris. We were joined at Tarbert by my brother, James W. Campbell.

A good deal of our time was spent in the Forest of Harris through the kindness of the late Sir Samuel Scott, but one afternoon we visited the island of Scalpay, which is situated at the entrance to East Loch Tarbert.

The island measures 1½ miles by 2¾ miles and forms a part of the extensive parish (123,752 acres) of Harris. It has a population of about 630, possesses a small sheltered harbour, one or two shops, and is visited once each fortnight by the Bank of Scotland. We gladly accepted the opportunity given us of accompanying the Bank to Scalpay.

Our visit was limited by the banking hours and it was not possible for us to cover much ground in the hour and three-quarters at our disposal. The fact that I have so far failed to find any mention of the Scalpay flora in any of the Outer Hebridean literature that I have investigated prompts me to give our complete list, which, though far from exhaustive, may serve as an introduction to the flora of this delightful little island.

Messrs Wilmott, Bangerter and I gradually wended our way up from the shore, hurriedly collecting "voucher" specimens, now all deposited in Herb. Mus. Brit. As we moved inland we found quite luxuriant patches of cultivation gay with such weeds as *Chrysanthemum segetum* and *Stachys palustris*. Further on we came upon moor and marsh, and Bangerter and I reached the edge of Loch an Duin, where we fished out *Sparganium affine* in fine flower, and on a bank above the loch we got *Polypodium vulgare*, by no means common in the Outer Hebrides, *Lonicera Periclymenum* and *Sorbus Aucuparia*. On our way back to the quay we collected a *Hieracium* from a steep cliff. J. W. Campbell also devoted some of his time to flowering plants and found a number of species that we had not seen, including *Hedera Helix*, a rarity in this part of Scotland, and *Osmunda regalis*. As we left, A. J. Wilmott picked *Spergularia rubra* from between the setts of the landing place.

I would like to thank the following for their determinations:—J. E. Lousley (*Rumex domesticus*); H. W. Pugsley (*Euphrasia*, see *Journ. Bot.*, lxxviii; *Hieracium*); A. E. Wade (*Myosotis*); A. J. Wilmott (*Rhinanthus* and others).

LIST OF VASCULAR PLANTS FROM SCALPAY.

Ranunculus repens L.
R. acer L.
R. Flammula L.
Caltha radicans Forster.
Nymphaea occidentalis (Ostenf.) Moss.
Cardamine pratensis L.
Cochlearia scotica Druce.
Capsella Bursa-pastoris (L.) Medik.
Raphanus Raphanistrum L. var. *aureus* Wilmott.
Viola Riviniana Rchb.
Polygala serpyllifolia Hose.
Cerastium vulgatum L. (*C. triviale* Link).
C. viscosum L.
Stellaria media (L.) Vill.
S. uliginosa Murr.
Spergula arvensis L. em., Rchb.
Spergularia salina J. & C. Presl.
S. rubra (L.) J. & C. Presl.
Hypericum pulchrum L.
Oxalis Acetosella L.
Trifolium pratense L.
T. repens L.
Lotus corniculatus L.
Vicia Cracca L.
Spiraea Ulmaria L.
Potentilla Anserina L.
P. erecta (L.) Hampe.
Rosa sp.
Sorbus Aucuparia L.
Sedum anglicum Huds.
Drosera rotundifolia L.
Myriophyllum alterniflorum DC.
Callitriche stagnalis Scop.
Epilobium obscurum Schreb.
E. palustre L.
Angelica sylvestris L.
Hedera Helix L.
[*Sambucus nigra* L.; bushes in cottage garden by North Harbour.]
Lonicera Periclymenum L.
Galium saxatile L.
Scabiosa Succisa L.
Solidago Virgaurea L.
Bellis perennis L.
Antennaria dioica (L.) Gaertn.
Achillea Millefolium L.
A. Ptarmica L.
Matricaria inodora L.
M. discoidea DC.
Senecio Jacobaea L.
S. vulgaris L.
Cirsium arvense (L.) Scop.
Centaurea nigra L.
Hieracium Schmidtii Tausch var. *crinigerum* Fr.
Hypochoeris radicata L.
Leontodon autumnalis L.
Sonchus asper Hill.
Lobelia Dortmanna L.
Vaccinium Myrtillus L.
Calluna vulgaris Hull.
Erica cinerea L.
E. Tetralix L.
Armeria maritima Willd.
Primula vulgaris Huds.
Glaux maritima L.
Menyanthes trifoliata L.
Myosotis cespitosa F. Schultz.
M. arvensis (L.). Hill.
M. versicolor Sm.
Euphrasia nemorosa (Pers.) Löhr var. *collina* Pugsl.
E. micrantha Rchb.
Odontites verna Bell.
Pedicularis palustris L.
P. sylvatica L.
Rhinanthus stenophyllus (Schur) Druce.
Pinguicula vulgaris L.
Prunella vulgaris L.
Stachys palustris L.
Galeopsis Tetrahit L.
Lamium purpureum L.
Plantago maritima L.
P. lanceolata L.
P. major L.
Littorella uniflora (L.) Asch.
Atriplex glabriuscula Edmondst.
Polygonum Persicaria L.
P. aviculare L. (sensu lato).
Rumex domesticus Hartm.
R. crispus L.
R. obtusifolius L.
R. Acetosa L.
R. Acetosella L.
Urtica dioica L.
Salix aurita L.
S. repens L. (sensu lato).
Iris Pseudacorus L.
Narthecium ossifragum Huds.
Juncus conglomeratus L. em., Koch.
J. bulbosus L.
J. squarrosus L.
J. Gerardi Lois.
J. bufonius L.
Luzula sylvatica (Huds.) Gaud.
L. multiflora Lej.
Sparganium angustifolium Michx. (*S. affine* Schnitzl.).
Triglochin palustre L.
Potamogeton polygonifolius Pourr.
Eleocharis multicaulis (Sm.) Sm.
Eriophorum angustifolium Honck.
Carex binervis L.
C. panicea L.
C. ovalis Good.
C. stellulata Good.

Anthoxanthum odoratum L.
Alopecurus geniculatus L.
Phleum pratense L.
Agrostis stolonifera L. var. *stolonifera* (L.) Koch.
A. canina L. var. *arida* Schlecht.
Aira praecox L.
Deschampsia flexuosa (L.) Trin.
Holcus lanatus L.
Arrhenatherum elatius (L.) M. & K.
Sieglingia decumbens (L.) Bernh.
Phragmites communis Trin.
Cynosurus cristatus L.
Molinia caerulea (L.) Moench.
Poa pratensis L.
P. trivialis L.
P. annua L.
Glyceria fluitans (L.) R. Br.
Puccinellia maritima (Huds.) Parl.
Festuca rubra L. var. *vulgaris* Gaud.
F. vivipara (L.) Sm.
Bromus hordeaceus L. sec. Fries.
Lolium perenne L.
Nardus stricta L.
Pteridium aquilinum (L.) Newm.
Blechnum Spicant With.
Athyrium Filix-foemina (L.) Roth.
Dryopteris aristata (Vill.) Druce.
D. dilatata (Hoffm.) Gray.
Polypodium vulgare L.
Osmunda regalis L.

AN APETALOUS MEADOWSWEET.

H. K. Airy-Shaw, B.A., F.L.S.

Whilst returning from an excursion of the Entomological Section of the Cotteswold Naturalists' Field Club along the " Golden Valley " between Chalford and Sapperton, Glos., on the 26th June last, my companion, Mr E. G. Neal, of Rendcomb College, Cirencester, remarked on the very creamy-yellow colour of a patch of meadowsweet that we happened to be passing. Upon investigation it transpired that the unusual colour was due to the almost complete absence of the white petals normally possessed by *Filipendula Ulmaria* [*B.P.L.*, 184/11], leaving only the ochre-yellow stamens (filaments as well as anthers) to provide the general hue for the entire inflorescence. Here and there an occasional flower could be seen which had one, or very rarely two, greatly reduced petals. There was no question of the petals having fallen exceptionally early, since none of the large proportion of flowers then still in " bud " had anything approaching the usual complement of petals. Many of the anthers in the " buds " showed signs of the development of anthocyanin on their exposed sides, similar to that often seen on the apices of the sepals. The flowers were otherwise perfectly normal, and by mid-July appeared to be setting normal fruit.

The plant in other respects represented the form, with leaves green below, which has been passing in this country for the var. *denudata* (Presl) Beck. I am indebted to my colleague, Mr N. Y. Sandwith, for the information that the true *denudata* is a very distinct plant, with the veins long-pilose beneath,* confined to Central Europe and the Balkans. The British form, therefore, is without a name (even if it merits one), unless it can be identified with anything in, e.g., the French flora. On this occasion no further plants of " *denudata* " were seen, and only the one small patch of 20-30 stems (possibly all one plant) of the apetalous form, growing amongst large quantities of the normal petaliferous var. *tomentosa*. Nothing, of course, can yet be said concerning the genetic basis, or possible ontological or seasonal fluctuation, of this aberrant form, but the colony will as far as possible be kept under observation.

No reference to any apetalous form of meadowsweet having so far been traced in the literature, the Gloucestershire plant may be distinguished as :—

Filipendula Ulmaria (L.) Maxim. forma *apetala* Airy-Shaw f. nov., floribus omnino apetalis vel hinc inde petalum unicum (rarissime duo) valde redactum gerentibus; foliis subtus viridibus nec niveis; petiolis, costis venulisque subtus brevissime viridulo-tomentellis.

V.-c. 34, W. Glos.; bank of stream (R. Frome) below Oakridge Lynch, near Frampton Mansell, 26 June and 15 July 1943, *H. K. Airy-Shaw* (Herbb. Kew. et Mus Brit.).

*See Hayek, *Fl. Steierm.* i. 871 (1909); *Prodr. Fl. Balcan.* i. 658 (1925).

NOTES ON BRITISH RUMICES:* II.

J. Edward Lousley.

The present war with its demands on restricted leisure and difficulties in consulting herbaria and the scarcer books has delayed until now continuation of the series of "Notes on British Rumices" commenced in the *B.E.C. Report* for 1938. The delay has had some advantages in revealing sources of information of which I was formerly unaware, and in allowing time for the more leisurely consideration of various difficult problems, but nevertheless solution of a number of questions remains impossible while present conditions prevail. This is especially the case where it is desirable to consult continental herbaria, but it is equally aggravating where copies of rare works are known to be normally accessible but at present dispersed for safety to places where access is unobtainable.

Lack of time has prevented completion of publication of the preliminary consideration of all the species and varieties recorded from Britain, but all those of the subgenus *Lapathum* with the exception of *R. obovatus* and *R. dentatus* are included in the present and earlier paper. These two species, with the addition of *R. Acetosa*, *R. Acetosella*, *R. scutatus* and the alleged "*R. arifolius*" to be reviewed in my next paper, will complete the British List.

As in the earlier paper the sequence of species is that of the *Plant List* though great revision will ultimately be necessary. The arrangement of material and abbreviations (with a few additions given later) remain as before. Descriptions are given only where the plants are not adequately described in easily accessible British works, and they are deliberately omitted in the case of adventives which have only occurred once or twice in Britain.

618/1. R. Hydrolapathum Hudson, *Fl. Angl.*, ed. 2, 154, 1778.

Icones. Eng. Bot., t. 2104 (poor—lower leaves not illustrated); Fitch & Smith, *Illustr. Brit. Fl.*, t. 861 (fruit poor); Moss, *Camb. Br. Fl.*, 2, t. 142, 1914 (good).

Exsicc. 14, E. Sussex; Landport near Lewes, Lousley (145); 17, Surrey; Thames' bank, Mortlake, Lousley (57).

From the description and synonomy given by Hudson (*loc. cit.*) there can be no doubt that he had in mind the plant which we now know under this name. He spelled the name as "*Hydrolapatheum*" and some writers still include the "e," but it seems that the original spelling was an "unintentional orthographic error" in the sense of Article 70 of the International Rules and should therefore be corrected. Hudson uses "*Hydrolapathum*" four times in his synonomy, and the fact that the single orthographical error is repeated in the third edition

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*For the first paper of this series see *B.E.C. 1938 Rep.*, 118-157, 1939.

of *Flora Anglica* in 1798 is no evidence that the author wished to perpetuate the error as the so-called third " edition " is apparently only a reprint of the second.

R. Hydrolapathum is a handsome well-defined species which cannot well be confused with any other British Dock, and it is perhaps for this reason that descriptions in our Floras are often inaccurate. The size of all parts is greater than that of any other native species—in height it often attains 2 metres, the leaves may have a length of as much as 11 dm. with a lamina of 7 dm. long, the fruiting valves are 6 to 8 mm. in length, the nuts about 4 mm. long, and the cotyledons at 12 mm. exceed in length those of any other British Dock.

The coriaceous texture of the somewhat glaucous dull green leaves is distinctive, and an important character in the determination of hybrids. They are usually described as gradually attenuated or tapering at the base, but this is by no means always the case. Observation in the field shows that leaves with cuneate, truncate or even sub-cordate bases are not infrequent. Plants with attenuate leaf-bases from streamsides produce broad-based leaves when transplanted into gardens—perhaps because of drier conditions. In his herbarium Borrer labelled a number of broad truncate or subcordate-based leaves as var. *latifolius* (sometimes as var. *latifolia*). The plants so labelled are a mixture, some being variants of *R. Hydrolapathum* while others, perhaps the majority, are the hybrid with *R. obtusifolius*. Trimen (*Journ. Bot.*, *12*, 35, 1874) published Borrer's name, applying it to the hybrid plant. A number of British botanists have been aware that pure *Hydrolapathum* sometimes produced these broad leaves. Thus Watson collected a good series from Surrey in 1874 which is preserved in Herb. Boswell-Syme (see *B.E.C. 1872/4 Rep.*, 37, 1875). W. H. Beeby recognised a Lincolnshire plant with subcordate leaves which was not the hybrid (*Naturalist*, 1896, 185; 1897, 170/1), and Salmon made the same distinction (*Fl. Surrey*, 571, 1931). It appears to be the *R. Hydrolapathum* forma *latifolius* of Zapalowicz (*Consp. Fl. Galic. crit.*, *2*, 689, 1908, where the hybrid is clearly differentiated), but I am very doubtful whether the variation is worthy of a name.

The fruiting valves are described by some British authors as " entire " (e.g. Druce in Hayward's *Botanist's Pocket-Book*, ed. 19, 169, 1930) or as " nearly entire " (e.g. Babington, *Manual*, ed. 10, 359, 1922). Actually they usually have a few short (less than ½ mm. long) denticulations towards the base, and failure to indicate this has led to many otherwise typical specimens of the species being incorrectly assigned to the hybrid with *obtusifolius*.

It is proposed to deal with *Rumex* hybrids separately in a later paper but it seems advisable to indicate here that *R. Hydrolapathum* × *R. obtusifolius* L. subsp. *agrestis* (Fries) Danser (*R. maximus* auct. angl. non Schreb.; *R. heterophyllus* Babington non Schultz) may be distinguished from *R. Hydrolapathum* by the usually broader, less acute, subcordate, much thinner leaves, less congested panicle usually with numerous infertile flowers, and valves with a more rounded base and often rather prominent acute denticulations towards the base.

Life History. The fruits are undoubtedly distributed through the agency of water and owing to the bouyancy of the tubercles they may float for a considerable period. Thus a number which were placed in a dish of water on September 7th, 1938, were all still floating on April 1st, 1939, and 10 fruits placed in a tube of water on November 19th, 1938, all remained floating after 147 days (April 15th, 1939) and continued to do so until they germinated about a month later.

Germination normally occurs in May or June, but may take place in late March or April if the temperature is exceptionally high. It is retarded in the absence of light, when the etiolated seedlings grow to a length of about 11 cm. before they die. The nuts germinate freely when floating in their perianths, and on June 14th, 1932, vast numbers of seedlings with the first three leaves well developed occurred on the masses of green algae (? *Enteromorpha* sp.) which choked a brackish dyke near Higham, West Kent. From a sowing of 10 fruits gathered at East Mersea in 1938 six seedlings were raised in May and June 1942, and of these one had three cotyledons. The production of an additional cotyledon is extremely rare in the Rumices and I know of no other similar instance though from a sowing of the hybrid *R. obtusifolius* × *palustris* I once obtained a seedling with a forked cotyledon. Seed gathered in the autumn germinates freely the following spring, only the winter resting period being necessary.

The leaves become tattered and decay early in the autumn and well before the first frosts; they reappear in early April—which is rather later than most British Docks.

Distribution. *R. Hydrolapathum* has been recorded from all the vice-counties of England and Wales with the exception of 42. 43, 46, 67, and 71. The only record for v.-c. 4 appears to be the entry in *Comital Flora.* In Scotland there are many vice-counties for which records or confirmation are desirable—I have only seen specimens from v.-c.'s 88, 89, and 102. For Ireland the plant is unrecorded for v.-c.'s H2, H26, H35 and H37 only, though credit for H16 rests solely on *Comital Flora.*

618/1 bis. R. AQUATICUS L., *Sp. Pl.*, 336, 1753, emend. Murbeck, *Bot. Not.*, 7, 1899—non auct. angl.

For further synonomy, citation of type specimen, *Icones.* and foreign *exsiccata*, description and distribution abroad—see *Journ. Bot.*, 78, 149-152, 1939.

British Exsicc. 86, Stirling; Shore of Loch Lomond at Balmaha, Lousley (236). 99, Dumbarton; Shore of Loch Lomond near Gartocharn, Lousley (232).

On August 6th, 1939, I was able to visit the locality whence Mr R. Mackechnie had first collected *R. aquaticus* in 1935. Here I found it extending for about 200 yards on sand-banks and along the alder-fringed shore. Later the same day I was pleased to find it again about two miles away, and in another county. At both places the plant grows in extremely aquatic conditions—in fact, although the level of Loch Lomond was low some individuals had their rootstocks nearly half a metre below the surface of the water. The most usual habitat in both stations was the loch-side margin of alder-swamps. It is undoubtedly native.

At Balmaha the following other Rumices grew nearby:—*R. crispus* L. (common), *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser (common), *R. crispus* L. × *R. obtusifolius* (frequent), *R. domesticus* Hartm. (1 plant only), *R. sanguineus* L. var. *viridis* Sibth., and 2 fine large plants of *R. aquaticus* L. × *R. obtusifolius* L. ssp. *agrestis* (Fries) Danser.

R. aquaticus is a most distinct species, not readily confused with any other British species when once authentic material has been seen. In the field the resemblance is perhaps rather to *R. Hydrolapathum*, from which it may be immediately known by the absence of tubercles on the valves, and the broad-based triangular leaves which have a similar thick, leathery texture. The outline of the leaves also distinguishes it from *R. domesticus*, from which it also differs in the less congested panicle, the pointed valves, and the almost imperceptible articulation of the pedicels.

Germination. Seeds germinated in May, June, July and August in my southern garden, and evidently only a short resting period is necessary, for nuts germinated freely the summer after they had ripened. Great difficulty was found in keeping the plants alive, and it was found necessary to grow the plants in pots kept continuously standing in water. It proved even more exacting in water requirements than *R. Hydrolapathum.*

618/2. R. DOMESTICUS Hartman, *Handb. Skand. Fl.*, ed. 1, 148, 1820; *R. longifolius* auct. angl., & ? DC. *Fl. France, 5* (*Suppl. 6*), 368, 1815; *R. aquaticus* Hooker, *Fl. Brit.*, 168, 1830 (non L.).

Icones. Eng. Bot. Suppl., t. 2698 (excellent); Moss, *Camb. Br. Fl.*, *2*, t. 143, 1914 (valve outlines inaccurate).

Exsicc. 66, Durham; Near Middleton-in-Teesdale, Lousley (101). 85, Kinross; Crook of Devon, Lousley (266). 77, Lanark; Strathaven, Lousley (231). 104, Skye; Broadford, Lousley (81).

This species is readily recognised by the very dense compact fusiform panicle, which is so very characteristic that the plant is easily detected even from a fast moving car. Unfortunately this feature is not illustrated in any British work. The valves are thin, membranous, reniform with entire margins and devoid of tubercles (though occasionally there may be a very slight thickening of the mid-rib).

There is still considerable doubt as to whether De Candolle's name should not be adopted in place of that of Hartman. The description given by the latter is brief, but there seems no doubt that it refers to our plant, and its use is preferred by Murbeck (*Bot. Not.*, 1899, 13) and by Rechinger (*Field Mus. of Nat. Hist.*, *17*, 100, 1937). De Candolle's description published five years earlier might well describe a slightly abnormal or hybrid plant of the species now under consideration, but there are several features in his account which are not quite convincing. Thus he says of the leaves " rétrécies à leurs deux extrémités " whereas the lower leaves (which he had just specifically mentioned) are truncate or even cordate at the base. He states that the flowers are " ordinairement géminés à l'aisselle des feuilles " which does not suggest the plant we have known under his name.

De Candolle based his *R. longifolius* on a specimen sent to him by Coder from the " environs de Prades, en Roussillon " (a district in which *R. domesticus* still occurs), and in an attempt to settle the question the authorities at Kew very kindly wrote to Geneva asking if De Candolle's type might be borrowed for examination. B. P. G. Hochreutiner of the Conservatoire et Jardin Botaniques replied on January 10th, 1939, as follows:—

" We have no specimen of *Rumex longifolius* from France. De Candolle remarks that Coder has sent him that specimen, but it is likely that De Candolle sent the plant back to him without keeping a duplicate.

According to Roumeguère (*Correspondances scient. inédites*, p. 164, 1876), Coder sold his herbarium to an English botanist whose name is not mentioned. Therefore we do not know where the plants from Coder are.

There was no specimen of *Rumex longifolius* in Herb. Boissier (as in Herb. Delessert)."

It thus appears likely that Coder's type specimen of De Candolle's *R. longifolius* was sent to this country, and may still be in a British Herbarium. If it can be found a very vexed question of nomenclature may be solved, but so far all my enquiries have been in vain.

R. domesticus varies extremely little in this country. Very rarely individuals may have an interrupted panicle (possible as a result of secondary growth after mutilation), and occasionally plants are seen with a looser panicle than I have described.

Distribution in Britain. *R. domesticus* occurs in Derbyshire, and in nearly all the vice-counties north of a line from the Ribble to the Humber. It attains its maximum abundance in Central Scotland, becoming less frequent (like several other Docks) in Northern Scotland where cultivated or disturbed ground is more restricted. Material has been seen from the following v.cc.—60, 62, 64, 65, 66!, 69, 70, 75, 77!, 79!, 81!, 83!, 85!, 86!, 87!, 88!, 89!, 90!, 91!, 92!, 93!, 94!, 95!, 96!, 97!, 99!, 104!, 105, 106, 107, 108, 111, 112. (! indicates that I have also seen the plant growing in the vice-county.)

The species is also recorded from the following, but voucher material has not yet been seen:—v.-cc.: 57, 67, 68, 72, 73, 74, 76, 78, 80, 84, 98, 102, 109, 110.

Search for *R. domesticus* should be made in v.-cc.: 61 (e.g. on banks of R. Ouse below York), 63, 71, 82, 100, 101, and 103, from which it is not yet recorded although known in adjoining vice-counties.

Life History. The thin papery texture of the valves and the absence of tubercles suggests that the fruits are dispersed primarily by wind-agency. When placed in water they soon sink—for example, of 10 fruits placed in water on November 19th, 1938, one sunk on the third day, 6 had sunk at the end of the week, and all by the 15th day. Thus they may well be moved short distances by streams or lochs.

Germination has occurred in my cultures in the south of England in April, May, August, September and October. No resting period appears to be necessary, as seed sown in the autumn a few weeks after it had ripened gave some immediate germination, although the majority of the seedlings did not appear until the following spring.

[618/2 bis. R. AQUITANICUS Rechinger fil. in *Fedde Repert.*, *26*, 177, 1929.

This species was described by Rechinger as very similar to *R. domesticus* in habit, but distinguished from that species by the cauline leaves, which are one and a half to twice as long as broad with their greatest width near the base and rather rough on their lower surface (radical leaves not seen), by the slightly crisped leaf margins, and especially by the much larger perianth-divisions which are toothed. It was based on three gatherings from the Western Pyrenees in the herbarium of the Musée d'Histoire Naturelle in Paris.

In November 1938 Dr Rechinger wrote to me as follows:—" . . . . May I call your attention to a plant very closely allied to *R. domesticus* which I described in 1929 in *Fedde Repertorium*, *Bd. 26*, p. 177, probably rather prematurely, as *R. aquitanicus* from the West Pyrenees. It is distinguished from *R. domesticus* chiefly by larger, irregularly toothed valves, of which one bears a tubercle. Some years ago I saw specimens very similar to the type (Herb. Paris) in Herb. Lund, Sweden, with the following labels: Shetland, Scalloway, Mainland, W. H. Beeby, Nos. 1027, 1028, 1030, 1031, 1032. It would be interesting to know whether this critical plant occurs there in the company of typical *R. domesticus*, or replaces it, and which other species are to be found there. The specimens in question in any case do not give the impression of being hybrids " (translation).

Beeby's valuable collection from the Shetlands is at the South London Botanical Institute, where it is kept apart from the general herbarium, and it contains all but one of the exsiccata mentioned by Rechinger. From the same locality Beeby collected *R. crispus* L. (No. 1035) and good *R. domesticus* Hartm. (No. 1033) and *R. obtusifolius* L. (No. 1024). No. 1032 is immature, and may well be only *R. domesticus*. Nos. 1028 and 1030 (with the addition of 1029) I should accept without hesitation as hybrids involving *R. domesticus* and *R. obtusifolius*, in spite of their apparent fertility. It is true that a partially infertile hybrid between these two species occurs freely, and I have selected such examples for distribution in my Exsiccata (Nos. 85, 86, 99, 102, 243, 247) as being good intermediates and beyond doubt. But whatever I have found *R. domesticus* growing in the company of *R. crispus* and *R. obtusifolius* there have also occurred a few plants which were very near to *R. domesticus* in most of their characters but showed evidence of the influence of *R. obtusifolius* and/or *R. crispus*, and yet appeared fully fertile (e.g. at Broadford, Skye; shores of Loch Leven, Kinross; and about Pitlochry, E. Perth.). Such plants I have supposed to be back-crosses of hybrids with *R. domesticus*, and I believe that Nos. 1027, 1028, and 1030 of Beeby's exsiccata cited by Rechinger have this origin. In any case I am convinced that they do not justify the addition of a new name to the British list. It should be added that Beeby's material was collected on various dates in 1887 and 1888, and that the consecutive reference numbers must have been added later as they have no connection with the sequence of the dates on the labels.]

618/3. R. CRISPUS L., *Sp. Pl.*, 335, 1753.

Icones. *Eng. Bot.*, t. 1998; Fitch & Smith, *Illustr. Br. Fl.*, t. 859 (fruit poor); Moss, *Camb. Br. Fl.*, *2*, t. 144, 1914.

Exsicc. 17, Surrey; Mitcham Junction, Lousley (24).

Type. Hb. Linn., No. 7, labelled "*9. crispus, Fl. Suec.*" in the handwriting of Linnaeus. This is a good specimen in fruit. The valves are rather small (*c.* 4 mm. in length), and all conspicuously tubercled. Unfortunately I omitted to note whether the tubercles were equal or unequal.

R. crispus is the most common of all the *Lapathum* Docks in Britain and unlikely to be confused with any other native species with the possible exception of *R. domesticus*, from which it is easily distinguished by the usually smaller (3-5 × 2-5 mm.) thicker valves, at least one of which bears a tubercle. Within the well defined specific limits there is perhaps more intra-specific variation than occurs in any other British Dock. The classification of this variation has proved extremely difficult.

The most common form in this country has lanceolate leaves with moderately crisped margins, neither very thin nor very fleshy, of approximately "Spinach Green" colour (R.H.S., o960/2); the panicle is moderately dense with a few leafy bracts; the valves are sub-rotund, orbicular-deltoid in outline, about 4.5 × 4 mm., with a repand margin; all three bear slightly elongate or subglobular tubercles, of which one is much larger than the other two.

This approximates very closely to the position in Holland—the only other country in which the variations of the species appear to have been studied in detail. Of Holland Danser (*Ned. Kruid. Arch.*, 1921, 184/5, 1922) wrote:—"The usual type of *R. crispus* in our country is an average strong plant of usually not quite a metre in height, with one or more main stems, with erect or slightly spreading branches. The root leaves are lanceolate, undulate and crisped, their base moderately rounded varying between cuneate and weakly cordate. The whorls are not leafy or only moderately so, interrupted only below, congested above. The fruiting panicle is dense. The ripe perianth is of medium size compared with other Rumices, about 4 mm. long, roundish and entire . . . , all the valves bear a round tubercle, the lateral ones being smaller than the primary. The longest peduncles are scarcely a centimetre long" (free translation from Dutch).

From Central Europe, Beck (*Fl. Nied. Österr.*, *1*, 320, 1890) describes the common form as var. (*a*) *typicus* with fruiting inner perianth segments 5 mm. long, all bearing tubercles which are unequal in size. From the examination of dried material I believe that throughout Europe the most common form of the species is the same as in this country, and most probably the plant represented in the Linnean Herbarium, and as described above by Beck and Danser.

At a meeting of the Botanical Society of Edinburgh on March 8, 1849, James Hardy described two British varieties of *R. crispus* (*Botanical Gazette*, *1*, 133, May 1849) as follows:—

> " *Rumex crispus* var. *littoreus*—All the divisions of the perianth tuberculated, tubercles subequal.
> —— var. *arvensis*—All the divisions tuberculated, one tubercle only perfectly developed."

The earliest name for the most common and widespread British form appears to be var. *arvensis* Hardy, while his *littoreus* includes the plant later described by Syme as var. *trigranulatus*.

Before discussion of the other varieties which have been said to occur in Britain, it seems desirable to summarise the wide range of variation which occurs. In the following table the common form (var. *arvensis* Hardy) as represented in my Exsiccata from 17, Surrey; Mitcham Junction, Lousley (24), in all cases illustrates the second (usually middle) character lettered " b." The specimens are all in my herbarium unless otherwise stated.

LEAVES.

1. *OUTLINE.*
   a. Narrow lanceolate.
      16, W. Kent.; Tidal Medway below Aylesford Bridge, 1934, Lousley.
      35, Monmouth; Tidal Banks of R. Wye near Tintern Abbey, 1933, Lousley.
   b. Lanceolate.
   c. Broad lanceolate.
      34, W. Glouc.; Avonmouth Docks, Lousley (160).

2. *MARGIN.*
   a. Very strongly crisped.
      9, Dorset; Allotments near Corfe, 1942, Dunston (L.10.42).
   b. Moderately crisped.
   c. Plane, or very nearly so.
      28, W. Norfolk; Hockham Fen, 1934, Lousley.
      35, Monmouth; Tintern, and 16, W. Kent; Aylesford—as above.

3. *TEXTURE.*
   a. Very thin.
      28, W. Norfolk; Hockham Fen, 1934, Lousley.
   b. Of medium thickness.
   c. Very thick and coarse.
      15, E. Kent; Shingle E. of Hythe, 1933, Lousley.
      21, Middlesex; Brentford, Lousley (143).
      34, W. Glouc., Avonmouth Dock, Lousley (160).

PANICLE.

4. *DENSITY.*
    - a. Very dense, branches strict.
        - 85, Fife; Seafield, Lousley (96).
    - b. Rather dense.
    - c. Interrupted, branches often rather spreading.
        - 16, W. Kent; Tidal Medway below Aylesford Bridge, 1934, Lousley.
        - 28, W. Norfolk; Hockham Fen, 1934, Lousley.

5. *LEAFINESS.*
    - b. With few leafy bracts.
    - c. With numerous prominent leafy bracts.
        - 21, Middlesex; Hort. ex Brentford, Lousley (143/a).
        - 28, W. Norfolk; Hockham Fen, 1934, Lousley.

FRUITING VALVES (in all cases there is usually slight variation between the valves in individual panicles).

6. *OUTLINE.*
    - b. Orbicular-deltoid.
    - c. Elongate-deltoid—apex sub-acute.
        - 28, W. Norfolk: Hockham Fen, 1934, Lousley.

7. *SIZE.*
    - a. Small (c. 3.5 × 3 mm.)—Uncommon.
        - 9, Dorset: Near Corfe in allotments, Dunston (K.18.42).
    - b. Intermediate (c. 4.5 × 4 mm.).
    - c. Large (c. 6 × 6 mm.)—rare and often adventive.
        - 29, Cambs.; Sandpit between Chatteris and Mepal, Lousley (132).
        - 34, W. Glouc.: Avonmouth Docks, Lousley (160).

8. *MARGIN.*
    - a. Entire.
        - 17, Surrey; Thames bank at Walton-on-Thames, Lousley (289).
    - b. Repand—occasionally with a few minute teeth near the base.
    - c. Denticulate—i.e. with definite teeth near the base.
        - 14, E. Sussex: Lewes, August 1872, J. L. Warren (Hb. Mus. Brit.—especially the sheet *not* marked "Petals toothed below.").

9. *TUBERCLES—PRESENCE OR ABSENCE.*
    - a. With 3 large more or less equally well-developed tubercles.
        - 85, Fife: Seafield, Lousley (96).
    - b. With 3 tubercles, of which one is much larger than the others.
    - c. With 1 tubercle only—the other two valves naked—rare.
        - 9, Dorset: By R. Corfe near Corfe, Dunston (K.18.42).
        - 17, Surrey; Punchbowl Lane, Dorking, 1914, Wilmott (534d) (Hb. Mus. Brit.).

The variations set out in the above table by no means exhaust those which I have observed in *R. crispus* in Britain. Variations in height and vegetative robustness are often striking. The colour of the leaves, normally a mid-green, is sometimes exceptionally dark-green, or rather bluish (sea-green), or even somewhat glaucous. The valves, normally light-brown when mature, may be bright green, rose or carmine. The tubercles vary greatly in size, may be brown or red of various shades, and vary in shape from sub-globular to very elongate. Moreover, in compiling the table I have deliberately excluded all plants to which the slightest suspicion of hybrid origin is attached, and especially the curious plants which occur in the presence of *rupestris* in Scilly and Glamorgan.

Most of the variations given in the table are inherited. Owing to limited opportunities of cultivating such a rampant pest I have only been able to prove this for myself in the cases of leaf outline and plane margin, and development of tubercles. Danser, however, cultivated 11 different divergent plants and his results reported in detail in *Ned. Kruid. Arch., 1921*, 182-195, 1922, showed that most of the deviations came true from seed sown in garden soil. Various comments by Syme and others scattered through British literature (e.g. *B.E.C. 1872/4 Rep.*, 36 and 37, 1875) tend to confirm this conclusion.

The difficulty is that few of the variations are constantly associated with one another, and hence a purely artificial classification such as that adopted by Ascherson & Graebner (*Syn. Mitteleur. Fl.*, *4*, 723/5, 1912) is unconvincing. Danser (*loc. cit.*) gave up the task in despair with the comment, " For the moment a natural classification of *R. crispus* seems to me impossible and an artificial superfluity." In this country some of the variations are better defined than most of those discussed by Danser, and moreover several of them have considerable ecological importance. It therefore seems desirable that names should be available for those which are most marked and permanent, always bearing in mind that a vast field of genetical and ecological work remains open for the confirmation or rejection of the conclusions to be set out below.

The following varieties and forms of *R. crispus* have been recorded for Britain, those given in Druce's *Brit. Pl. List*, ed. 2, being considered first.

Var. b. TRIGRANULATUS J. T. Boswell (=Boswell-Syme) in *B.E.C. 1872/4 Rep.*, 37, 1875 (reprinted in *Journ. Bot.*, *13*, 373, 1875).

Boswell in his original description stressed four characters in which his plant differed from the common form of *crispus* as follows:—(1) the littoral habit, (2) the very dense panicle—recalling that of *domesticus*, (3) the triangular-ovate valves, and (4) the presence of conspicuous tubercles on all three valves. He cited three gatherings, for which I give the herbaria in which I have seen material:—(1) Swanbister, Orphir, Orkney, 1874 (Hb. Syme and Hb. Mus. Brit. contain specimens dated 1873—a misprint in the original account is probable). (2) Brodick, Arran, 1873 (no material seen), and (3) Seafield, near Kirkcaldy, Fife, 1874 (Hb. Mus. Brit.). The last mentioned specimen may be regarded as the type, and agrees with Syme's description. I visited Seafield on July 29, 1938, and found a similar plant abundant on the upper sea-shore, and of this I distributed specimens in my exsiccata (No. 96). From this gathering I sowed fruits in my garden, and confirmed Syme's statement that the characters of the variation are reproduced from seed.

The trigranulate *R. crispus* of the south coast of England differs slightly from the Scottish material, and the panicle, although often dense, can seldom be said to be sufficiently large and dense to " have the appearance of *domesticus*." Nevertheless Syme later determined specimens from southern England as belonging to his variety.

Inland plants of *R. crispus* may sometimes have conspicuous tubercles on all three valves (e.g. 8, S. Wilts.; Near Donhead St Mary, 1941, A. Dunston in Hb. Lousley), but in such cases the panicle is seldom dense. and the leaves are not fleshy as in the maritime plant.

It seems that var. *trigranulatus* Syme *sensu latissimo* must be regarded as a synonym of the earlier var. *littoreus* Hardy (see below). In the restricted sense it may be kept up as a form of *littoreus* to be applied to plants similar to those from Seafield.

Var. c. LITTOREUS Hardy in *Botanical Gazette*, *1*, 133, 1849.

Hardy's original description has been quoted above—I have not traced a specimen collected or named by the describer. The littoral habit is implied in the choice of name.

Var. *littoreus* is a maritime plant common on shingle and dunes all round the British coast, and has been frequently recorded as var. *trigranulatus* Syme.

Var. d. PLANIFOLIUS Schur, *Enum. Pl. Transs.*, 580, 1866.

Schur described this variety as follows:—" Foliis latioribus planis viridibus longius acuminatis crenatis; verticillis ab invicem remotis in spicam aphyllam dispositis; floribus minimus. Auf nassen Weisen bei Kronstadt. Aug." It was thus a plant of wet upland meadows remote from the sea.

Moss (*Camb. Br. Fl.*, *2*, 139, 1914) applied Schur's name to a plant which had been collected by Augustin Ley on estuarine mud of the Wye at Tintern, Monmouthshire, on July 30, 1870 (Hb. Syme), July 30, 1878 (Hb. Kew) (*B.E.C. 1877/8 Rep.*, 18, 1879), September 13, 1879 (Hb. Syme) (*B.E.C. 1879 Rep.*, 18, 1880), July 26, 1880 (Hb. Syme & Hb. Kew) (*B.E.C. 1880 Rep.*, 34/5, 1881), and August 6, 1884 (*B.E.C. 1884 Rep.*, 109, 1885).

I have studied this plant growing on the banks of the Wye by Tintern Abbey on several occasions between July 1933 and August 1938. It grows on oozing estuarine mud where in spite of its height—the plant is often over 2 metres tall—it is often completely covered at high tide. Thus all the parts are usually coated with a greyish deposit which makes the leaves appear glaucous and obscures the details of the valves. The leaves are narrow-lanceolate, often tapering at both ends, flat (not crisped), with the lamina usually over 30 cms. long. The panicle is lax with remote rather leafy whorls. The valves are deltoid, subacute at the apex, very unequally trigranulate, or unigranulate with rather long (c. 8 mm.) filiform peduncles.

It will be seen that this plant disagrees with Schur's description in the width and margin of the leaves, in the presence of leaves in the panicles, and probably in the size of the flowers. It agrees better with var. *uliginosus* Le Gall, which was described in the *Flore du Morbihan*, 500, 1852, as follows:—

" Feuilles allongées-lancéolées, très atténuées à la base, planes ou presque planes, au moins les inférieures. Faux verticilles médiocrement fournis et la plupart écartés; les inférieurs munis d'une feuille, les supérieurs nus. Calice pourvu d'un seul grain et parfois non granifère. —Lieux limoneux souvent couvert par le flux de la mer. AR. Tré-Auray, près d'Auray, bords du Blavet à Hennebont.'' It will be seen that the two localities given by Le Gall are on tidal mud near the mouths of rivers on the Atlantic coast of Brittany, a type of habitat very similar to those in which the British plant occurs.

Trimen, Briggs and others have considered that Ley's plant was the same as the Thames-side plant which has been called *R. elongatus* (see below), and I agree that the differences between the plants are insufficient to justify giving them different names. The plant from the Thames is less robust, with a more leafy, less lax panicle, and the leaves may taper a little more at the base, but I can only regard it as a slightly more extreme example of the same variation, possibly exaggerated by longer submergence at high tide.

I have not so far succeeded in growing the Tintern plant to maturity in garden soil, but year old seedlings had thin pale-green leaves which were quite plane, about 20 cm. in length and narrow lanceolate. It appears therefore that the leaf characters are reproduced from seed.

Material of var. *uliginosus* has been seen as follows:—

16, W. Kent; Tidal Medway below Aylesford Bridge, 1934, Lousley (Hb. Lousley).
17, Surrey; Estuarine mud of R. Thames from Putney to Kew Bridge—various collectors—see below under "*R. elongatus*."
35, Monmouth; Tidal banks of R. Wye by Tintern Abbey, A. Ley (see above); 1933 and 1938, Lousley (Hb. Lousley).
H.8, Limerick; Estuarine mud of Shannon below Limerick, 1937, Lousley (Hb. Lousley).

Miss E. Vachell has sent me specimens of an interesting Dock which she collected in the company of Hon. Guy Charteris and Miss Wilkinson on estuarine mud near the mouth of the River Thaw, Aberthaw, Glamorgan, v.-c. 41. This plant has leaves which are flatter than those of var. *arvensis,* and they have a pseudo-glaucous appearance owing to a thin coating of mud. The panicle is very robust and much branched, with elongate deltoid valves. It is not var. *uliginosus,* and at present I prefer not to give it a name.

The "*R. crispus* var. *elongatus*" from tidal banks of the Itchen near Southampton collected by Augustin Ley on August 11, 1882 (Hb. Mus. Brit.) is *R. Hydrolapathum* (*B.E.C. 1882 Rep.*, *76*, 1884).

Var. e. UNICALLOSUS Petermann, *Fl. Lips.*, 266, 1838.

This was described by the author as "petelium unicum calliferum," and small colonies of plants on which only one valve of the three in the perianth bears a tubercle may occasionally be found in populations of normal var. *arvensis.* I prefer to regard the variation as a form rather than a variety.

The earliest use of the name in Britain appears to be on sheets collected by G. C. Druce from v.-c. 23, Oxon.; Godstow, June 1893. There are two sheets of this gathering in Hb. Mus. Brit., one is said to be "teste Freyn," the other which is not so marked is more mature and more convincing. On the two valves which should be completely naked in each perianth, traces of small tubercles can often be seen.

The following specimens of this form have been seen:—

9, Dorset; By River Corfe, near Corfe, 1942, A. Dunston (K.18.42) (Hb. Lousley).
17, Surrey; Punchbowl Lane, Dorking, 1914, A. J. Wilmott (5334d) (Hb. Mus. Brit.); Thames-bank at Walton-on-Thames, Lousley (289).
96, Easterness; Near Nairn, 1898, E. S. Marshall (2182) (Hb. Mus. Brit.).

Var. f. SUBCORDATUS Warren in *B.E.C. 1872/4 Rep.*, 36 1875 (var. *dentatus* Warren ex Boswell, *loc. cit.*; var. *serratus* Warren ex Boswell, *loc. cit.*—the last two names withdrawn on publication).

The publication of this name is contained in a single paragraph which contains so many contradictions and inaccuracies—to say nothing of a material misprint—that it is almost the perfect example of how *not* to introduce a new name!

Warren described his new variety as follows:—"It differs from ordinary *crispus* by its great size (five or six feet) and by the shape of its enlarged sepals, most of which are more or less toothed." He thus relies on three characters:—(1) "Great size (five or six feet);" (2) the shape of the valves (later evidence suggests that he intended to indicate that they were subcordate and/or broader than ordinary *crispus*), and (3) valves "more or less toothed." He cites two gatherings:—

(1) "Teffont, Wilts., October 1872," of which I have seen the following sheets:—(a) Hb. Syme—2 sheets as "var. *dentatus* Warren," (b) Hb. Watson—as "var. *serratus* Warren, 1870," (c) Hb. Kew—as var. *subcordatus*, and (d) Hb. Mus. Brit.—as var. *subcordatus* (Herb. Trimen). These plants are all very luxuriant with leaves broader (up to 8 cm.) than normal *crispus*. They vary a little, but the valves are usually large (c. 5 × 4.5 mm.), rather deltoid, and slightly toothed near the base, but the latter character is very inconstant even in single panicles.

(2) "Lewes, Sussex, July 1872." Of this there are two sheets in Hb. Mus. Brit. as "The Lewes Dock." One has rather small valves (c. 4.5 × 4.5 mm.), unequally trigranulate, their outline rotund-deltoid and denticulation extremely slight. The second has larger valves (c. 5 × 4.5 mm.), definitely denticulate, with a large shining tubercle on one valve only. There is a third sheet dated 1871.

These gatherings are therefore not homogeneous, and the only noteworthy character common to them all is the robustness of most of their parts.

Boswell (better known as Syme) then proceeded to elaborate the new variety, stating that the panicle was lax with spreading branches, the valves "larger and broader than in the common form, being deltoid or subrotund-deltoid," and that only one of the three bore a tubercle. These additional characters do not help to give a clear picture of the way in which the variety differed, and the specimens sent by Syme from Fife and Kinross are quite different from Warren's material. Specimens collected in August 1874 from Balwearie, Fife (Hb. Mus. Brit.) are undoubtedly of hybrid origin, while three gatherings made by Syme in the same month from Balmuto, Fife (Hb. Mus. Brit.) represent three different plants, two of them being very near to normal *crispus*.

Boswell stated that Warren proposed "to apply to the variety the name *subcordatus* instead of '*dentatus*' or '*serratus*'," but the omission of three essential words (cf. reprint in *Journ. Bot.*, *13*, 347, 1875) caused Bennett to believe that "*subcordatus*" was the name to be withdrawn (*B.E.C. 1892 Rep.*, 385, 1893).

Material collected by Brotherston from Tweedside, Kelso, August 1876 (Hb. Mus. Brit.), was said by Warren to be "the exact thing" (*B.E.C. 1876 Rep.*, 32, 1878), and it certainly more closely resembles the Teffont material than do the Scottish plants of Syme.

Warren's *subcordatus* is best disregarded as a *nomen confusum*. I have dealt with it in some detail because it has been taken up by Ascherson & Graebner and other continental writers who have probably not had access to the material on which it was based.

Var. f. ROBUSTUS Rechinger pater, *O.B.Z.*, *42*, *1891*, No. 12, 17, 1892.

This was described by the senior Rechinger as follows:—"Differt a typo statura elatiori, foliis latioribus, praecipue valvarum magnitudine et forma, eis R. Patientiae simillimis minime quidem stirps hybrida." He adds that this variety is easily mistaken for the hybrid of *R. crispus* with *R. Patientia*, but occurs in places where the latter is absent. All three valves carry tubercles, but one tubercle is larger than the other two. Rechinger states that it resembles certain forms of *R. crispus* found in Southern Europe, but has rather less distinct teeth on the even larger valves.

Dr K. H. Rechinger, Jnr., has informed me that, in his opinion, his father would have applied his varietal name to the following plants distributed in my Exsiccata:—

21, Middlesex; Brentford, Lousley (143).
29, Cambs.; Sandpit between Chatteris and Mepal, Lousley (132).
34, W. Glouc.; Avonmouth Docks, Lousley (160).

The Avonmouth plant was undoubtedly adventive—the other two most probably so. All agree in the strong superficial resemblance to *R. Patientia*. Warren's plants from v.-c. 8, S. Wilts.; Teffont, and v.-c. 14, E. Sussex; Lewes, cited in the discussion of var. *subcordatus* (above), also belong here.

Var. g. STRICTISSIMUS Rechinger pater in *Ann. Naturhist. Mus. Wien*, *36*, 153, 1923.

This was described as " Differt a R. crispo typico statura strictissima (R. fennico Murb. simili) ramis paniculae brevibus ± axi principali adpressis. Foliis omnibus (inclus. radicalibus) angustioribus acutissimis, margine haud crispatis. Valvis integerrimis, callis tribus tumescentibus magnitudine varia (pro specie bene et distinctissime evolutis)".

In November 1938 I sent Dr Rechinger, Jnr., specimens of my gathering of var. *trigranulatus* from Seafield (No. 96), drawing his attention to the characteristically dense and fastigiate panicle. He replied " *R. crispus* L. var. *strictissimus* Rech. pat. is apparently a synonym of true var. *trigranulatus*." The leaves of the Scotch plant I should not have regarded as exceptionally narrow, and there is no good reason to add var. *strictissimus* to the British list.

The British varieties of this species may be tentatively summarised as follows:—

R. crispus Linn.

Var. a. *arvensis* Hardy (var. *typicus* Beck). Leaves lanceolate with undulate, usually crisped, margin. Panicle with a few leafy bracts; valves not large (c. 4.5 × 4 mm.), all three bearing tubercles, one of which is larger than the others. Very common, in fields, roadsides, etc.

Forma *unicallosus* (Petermann) comb. nov. Only one valve bearing a tubercle—the other two naked.

Var. b. *littoreus* Hardy. All three valves with large subequal tubercles. Leaves often rather fleshy. Panicle often dense. Frequent on maritime dunes and shingle all round the coast.

Forma *trigranulatus* (Syme) comb. nov. Panicle fastigiate, very dense.—Northern coasts.

Var. c. *uliginosus* Le Gall (var. *planifolius* Moss non Schur; *R. elongatus* Trimen & Ley, non Gussone). Leaves narrow lanceolate, often tapering at both ends, flat (not crisped). Panicle lax with ± leafy whorls which are remote below. Valves elongate, deltoid, subacute. Rare, on estuarine mud by Thames, Wye, Medway and Shannon.

Var. d. *robustus* Rech. pat. Plant very robust, simulating *R. Patientia*. Leaves broad lanceolate, coarse. Panicle very large. Valves very large (c. 6 × 6 mm.), thick, margin often repand or denticulate. Rare, probably always adventive.

Life History. R. crispus probably germinates in any month of the year unless conditions are very cold or very dry. In my cultures this has taken place in February, March, April, May, June and August. It seems usual for germination from any batch of seed to be intermittent, and this feature is more marked with autumn sowings than with seed sown in the spring. No resting period appears to be necessary, and I have had seedlings appear from fruits which had been gathered from the parent plant only 12 days earlier. Vitality is said to be retained for very long periods under natural conditions; for at least 40 years (Darlington, *Amer. Journ. Bot.*, *9*, 266) or 60 years (Salisbury, *Nature*, *149*, 596, May 30, 1942). Using fruits from my Herbarium of three different gatherings only 15 and 17 years old, I have been unable to induce any germination, but seeds 10 years old germinated freely. It is stated by Skene (*Biology of Flowering Plants*, 426, 1926) that *R. crispus* is amongst the plants with seeds which "can germinate only in light or have their germination promoted by illumination." Of three of my experiments this was true, the results being as follows:—

	Germinated in (a) Light.	Germinated in (b) Dark.
Experiment 1	10	None
do. 2	10	1
do. 3	9	1

(10 fruits were used in all cases.)

Two other experiments gave very different results. In both cases the material used was var. *littoreus*. The results were as follows:—

	Germinated in Light.	Germinated in Dark.
Experiment 4	9	9
do. 5	10	9

The results were not influenced by age of the seed or any other factor that I have been able to deduce, and I think it very probable that dependence on light for germination varies in the different ecotypes of the species.

In my rather crowded garden cultures it took the plants about a year to reach maturity, but the period is undoubtedly shorter under favourable natural conditions. For example a piece of ground at Streatham Fire Station was thoroughly dug over and cleared in October 1938. Seedlings were noticed in May, and had leaves 30 cm. long by the end of June; by September they had flowered and fruited.

In normal years fresh green leaves appear during the third week of March, and die off at the time the plants pass into fruit. About half the plants in most populations die after fruiting, the remainder put forth occasional ill-formed small leaves during mild spells in the winter, and fully formed ones arise laterally from the crown the following spring.

It is stated by Ridley (*The Dispersal of Plants throughout the World*, 224, 1930) that according to Guppy the fruits of *R. crispus* float for one to six months, and according to Praeger for as long as 15 months. In my own experiments germination has usually occurred at much shorter intervals and only the empty valves have been left floating. In two cases fruits of the conspicuously trigranulate var. *littoreus* remained

100% floating for 2 and 5 months respectively, but the smaller tubercled inland plants have always started to sink much sooner. In any case the period for which they float is long enough for the plant to be dispersed a considerable distance by water. The fruits of *R. crispus* are probably dispersed by wind, water and by animals.

Flowering usually commences in the first week of June in the south of England and continues until severe frosts set in. Most fruit matures in July and August, but it continues until November.

Distribution. Native; in grass- and water-meadows, pond- and stream-sides, waste places and roadsides, cultivated ground including temporary leys, on estuarine mud (as var. *uliginosus* Le Gall) and dune-slacks, beaches and sub-maritime embankments (as var. *littoreus* Hardy). Abundant throughout the British Isles, and recorded for every vice-county. The most ubiquous of all British Docks, and scheduled as a weed injurious to agriculture.

Distribution abroad. Native throughout Europe and most of Asia, and now well established in most other parts of the world.

618/4. R. ELONGATUS Trimen, *Journ. Bot.*, *11*, 237, 1873, non Gussone.

Specimen typical of the plant intended by Trimen: 17. Surrey; Thames-bank between Putney and Hammersmith Bridges, July 7, 1873, marked "conf. *R. elongatus* Gussone" in Trimen's handwriting, H. Trimen (Hb. Mus. Brit.).

Exsicc. 17, Surrey; Thames-side between Putney and Hammersmith, July 28, 1875—not good examples (Hb. Syme); cultivated by H. C. Watson, July 1874, from root of plant named by Warren and Newbould brought from Thames-side above Putney in autumn of 1873 (Hb. Syme); cultivated by H. C. Watson from seed of Putney Dock sown in 1874, root-leaf September 2, 1874, fruiting panicles 1875 (Hb. Watson); by the Thames between Putney and Hammersmith Bridge, June 29, 1920—(immature), C. E. Britton (Ref. 2199) (Hb. Mus. Brit.); estuarine mud near Mortlake, July 1, 1933—(immature), Lousley (Hb. Lousley); estuarine mud above Kew Bridge, July 1 and August 17, 1933, Lousley (Hb. Lousley).

Trimen's plant differs from *R. crispus* var. *arvensis* Hardy in the linear-lanceolate radical leaves which are plane and entire, not crisped, and attenuated at the base into a long petiole. The panicle is lax, with the whorls distant and leafy below, and the valves are rather elongate, one with a tubercle, the other two naked or with minute tubercles which are little more than a thickening of the mid-rib. The foliage has been said to be "markedly glaucous" (*B.E.C. 1920 Rep.*, 247, 1921), but this I believe to be due to the thin film of fine mud which when dry gives a pseudo-glaucous appearance. In ripe fruit the characteristics of the plant largely disappear, and hence mature material has very seldom been collected. C. E. Salmon (*Fl. Surrey*, 569, 1931) states that "The acutely triquetrous angles of the nuts appear to be distinct from the trigonous angles in *crispus*," and also that they are reddish-brown instead of dark-brown. Careful examination of my own material fails to reveal the slightest difference between the nuts of the two plants.

Trimen's *elongatus* has been found during the last eighty years at intervals from Putney to just above Kew Bridge. As Pugsley remarks (*Watson B.E.C. 1923/4 Rep.*, 259, 1924) it is confined to the tidal mud-banks and does not grow on the waste-ground above the river-wall. At the three places where I have seen it the plant grew on the inner side of clumps of ×*Scirpus carinatus* (Smith). Reconstruction of the river-wall destroyed the colonies known to me, and I have not seen it since 1938.

The Thames-side plant remains substantially unchanged by cultivation, both from root and from seed. Watson's results were preserved as dried material (see above), and I have grown the plant in garden soil for over two years without much change occurring (*Journ. Bot.*, *73*, 259, 1935). So many variations of *R. crispus*, including even comparatively trivial ones, are now known to come true from seed and to remain constant in garden soil, that I now attach far less importance to this fact than I did formerly (*loc. cit.*).

With evident caution Trimen (*loc cit.*) said that his Thames specimens " seem referable " to the plant described as *Rumex elongatus* by Gussone. Four years later, when discussing plants collected by Ley from Tintern in 1878 (cited above under var. " *planifolius* "), he wrote " . . . . Quite the same as the Thames plant. Whatever may be its proper name, it cannot be separated *as a species* from *R. crispus*" (*B.E.C., 1877/8 Rep.*, 18, 1879). Nevertheless, subsequent British writers including Druce (*Brit. Pl. List, ed. 2*, 101, 1928), Moss (*Camb. Br. Fl.*, *2*, 139, 1914), Salmon (*Fl. Surrey*, 569, 1931), and the compilers of the *London Catalogue, ed. 11* (39, 1925), appear to have been quite satisfied with the identity of the British Plant with that of Gussone and with its specific grade. In earlier editions of the *London Catalogue* (*Ed. 8*, 1886; *Ed. 9*, 1895, and *Ed. 10*, 1908) and of Druce's *British Plant List* (*Ed. 1*, 1908) it was reduced to a variety of *R. crispus* L.

Gussone (**Plantae rariores*, 150, t. 28, 1826) described *R. elongatus* as having root-leaves 4 to 6 inches long and scarcely one inch broad, oblong-lanceolate, sub-undulate, oblique at the base, long petioled. The stem leaves were sublinear, the lower whorls were leafy and remote, the valves cordate-ovate, only one of them tubercled, pale-green. His plant grew in marshes in southern Italy. The excellent plate depicts a plant rather similar to a form of *R. crispus* which occasionally occurs in marshes in this country (e.g. 28, W. Norfolk; Hockham Fen, July 7, 1934, Lousley (Hb. Lousley)). There is considerable resemblance to our Thames-side plant, which however is not identical.

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*This work is variously cited as *Pl. Rar. Adriat.* (Moss), and *Pl. rar. Neapol.* (Ascherson & Graebner; Salmon). There is no reference in the title to Naples, which is the place of publication. Owing to the war I have been unable to refer again to this valuable book, and depend on my notes made some years ago.

In the following year Gussone described his plant again (*Fl. Sic. Prodr.*, *1*, 443, 1827), and this time he also described *R. crispus*, which he said had tubercles on all the valves, and lanceolate instead of linear-lanceolate leaves. He cites Ddingoli as a station for his *R. elongatus*, and a specimen so labelled by Gussone in the Botanical Museum at Palermo has been examined by Murbeck. The latter discusses this specimen, which must apparently be regarded as the type of Gussone's species, in *Botaniska Notiser*, 1913, 227, where he points out, *inter alia*, that one of the leaves is not only finely crinkled on the margin but also distinctly undulate in the lower third. He concludes that he has no doubt that *R. elongatus* Guss. is identical with *R. crispus* L. No other specimen collected by Gussone appears to exist.

Later Gussone described his plant again (*Fl. Sic. Syn.*, *1*, 431, 1842). He no longer gave *R. crispus* from Sicily, but said *elongatus* differed from it in having ovate and not cordate-orbicular valves, only one of which is tubercled. Gussone's plant is kept up as a variety of *R. crispus* by Fiori (*N. Fl. Anal. Ital.*, *1*, 402, 1923). Italian botanists are best able to judge whether *elongatus* is worth retaining as a variety in their own Floras, but I am convinced that this plant of mountain marshes in the Central Mediterranean area is not to be identified with our plant of tidal estuarine mud.

Neither is our plant *R. Turcicus* Boissier & Balansa ex Boissier (*Diagn.*, *Ser. 2*, *No. 4*, 79, 1859) if one can judge from the dense panicles and larger fruits of specimens grown from Balansa's seed (Hb. Kew).

I sent Thames-side material to Dr Rechinger in 1933 and he replied "*R. elongatus* Guss. is a synonym of *R. crispus* L.; your specimens belong perhaps to an alien type of this species which I do not know exactly." Specimens of the same gathering were also sent to Dr Danser who wrote "*R. crispus* L. (mud forms often have little crisped leaves)" (*Watson B.E.C. 1933/4 Rep.*, 232, 1934).

The Thames "*elongatus*" appears to be correctly identified with *R. crispus* L. var. *uliginosus* Le Gall (*Fl. Morb.*, 500, 1852) of which I have quoted the original description above. As already stated I think the Tintern plants which Trimen and Ley called *elongatus*, although less convincing, should also be assigned to var. *uliginosus* Le Gall. There seems no valid reason to regard the plant of either locality as adventive.

618/5. R. ALPINUS L., *Sp. Pl.*, 334, 1753.

Icones. *Eng. Bot. Suppl.*, t. 2694; Moss, *Camb. Br. Fl.*, *2*, t. 141, 1914; Butcher & Strudwick, *Furth. Ill.*, t. 320, 1930 (panicle too lax, marginal undulation of valves exaggerated).

Exsicc. 89, E. Perth.; Kirkmichael, Lousley (245). 90, Angus; Afflochie near Brechin, Lousley (91).

Linnean specimen. Hb. Linn., No. 35, labelled "*alpinus*" in the handwriting of Linnaeus and "H.U." (Hort. Upsala). This sheet bears one small leaf, and a small spike of flowers, and is undoubtedly our plant.

R. alpinus is well known under the popular name of Monk's Rhubarb, and should present no difficulty in identification. The extensively creeping rootstock at once distinguishes it from all other Docks (Lapatha) found in Britain with the exception of the very thick-leaved *R. cuneifolius.* The very dense and fusiform panicle, and thin, ovate entire valves devoid of tubercles might lead to confusion with *R. domesticus*, but the valves are truncate rather than subcordate at the base, and the leaves are very different.

The considerable size of the radical leaves (20-40 × 20-35 cm.) is seldom revealed in the small specimens selected for the Herbarium, which, however, usually illustrate the thin texture, orbicular or broad-ovate outline, deep cordate base, obtuse apex and entire margins. They may thus be distinguished from the less rotund, less obtuse basal leaves of *R. confertus* Willd. (cf. *B.E.C. 1938 Rep.*, 149, 1939). On one occasion I was taken to see the thicker, more pointed, coarser-veined leaves of a Garden Rhubarb (*Rheum* sp.) which two botanists had collected as *R. alpinus.*

Life History. From the membranous nature of the valves the fruits would appear to be wind-distributed, but in this country new plants perhaps seldom arise from seed, and very rarely at any distance from the parent. In water the fruits soon sink; of 10 which were placed in water on November 19th, 1938, only one remained floating on the third day, and that one sunk on the fifth day. Germination has occurred in my southern garden in April and September. No resting period is necessary since seed gathered on July 28th, 1938, germinated just over a month later, but germination is slightly intermittent, for some of this same sowing did not sprout until the following spring. Owing to shading, competition between the seedlings was very keen. Hegi (1913, 173) states that the seeds remain viable up to 13 years.

Monk's Rhubarb is undoubtedly always a relic of cultivation in Britain, but it often persists for very long periods. Several writers agree in stating that it has been introduced in order to obtain the large leaves for the purpose of wrapping round butter, but its presence at several localities connected with monasteries suggests that it may also have been planted for medicinal purposes, and Dunn (*Alien Fl. Brit.*, 166, 1905) states that it was formerly cultivated in Britain for its roots, which were apparently used medicinally. On the continent the young leaves have been used as salading or spinach, the larger leaves as fodder or pig-food, and medical uses include the application of fresh leaves to body-sores. Once *R. alpinus* is established the creeping rootstock makes it most difficult to eradicate. Thus, while it is most often found near farms and cottages, some of its stations are on streamsides or roadsides at some distance from human habitation. At such places it is sometimes accompanied by other introduced species.

Distribution. *R. alpinus* occurs in hilly districts from Staffordshire and Derbyshire northwards. It has also been recorded from a few southern vice-counties. I have seen voucher Herbarium material as follows, the vice-counties in which I have seen the plant growing being marked with an exclamation mark:—

39, Staffs; Near Cheadle, 1923, Masefield (Hb. Kew).
57, Derby; One Ash Grange near Money Ash, 1832 (Hb. Syme).
64, Mid-West Yorks.; Adel, Leeds, 1896, Wheldon (Hb. Wales).
70!, Cumberland; Mossdike Farm, Mungrisdale, 1937, Lousley (Hb. Lousley).
72, Dumfries; Grierson (Hb. Syme).
85!, Fife; Newhaven to Inverkeithing, 1839, Graham (Hb. Cantab.).
87!, W. Perth; Near Callandar, 1844, Babington (Hb. Cantab.).
88!, Mid-Perth; Methven Hill, 1888, Hanbury (Hb. Hanbury).
89!, E. Perth; Kinnaird Burn, Moulin, Brebner (Hb. B.-W.).
90!, Angus; Roadside on the highway from Forfar to Montrose, 1915, Marshall (Hb. Marshall).
92 or 93, Aberdeen; Garden near Stricken, 1917, H. M. Fraser (Hb. Kew).
94, Banff; Near Portsoy, 1865, Bisset (Hb. Cantab.).
95!, Moray; Brodieshill near Forres, Lousley (89).
98, Argyll; Roadside near Glen Lane (doubtless Glenlean, Clachaig, intended), 1862, Hooker (Hb. Kew).
99, Dumbarton; Near Helensburgh, Hooker (Hb. Kew).

In my experience the plant has its headquarters in East-, Mid- and West-Perthshire and Kinross, in which vice-counties it has been seen in numerous places. In altitude it ranges from 200 ft. at Leitchhill, Mid-Perth., to 1100 ft. near the Spital of Glenshee, East Perth. On roadsides it is seldom seen in flower, perhaps owing to the cutting of roadside vegetation, but more probably owing to lack of moisture since many Scottish roadsides are uncut, and it flowers and fruits freely enough by streamsides. Hegi (*l.c.*) says that it is an ammonia-loving plant, but it shows no great affinity for muck heaps in Britain.

618/6. R. OBTUSIFOLIUS L., *Sp. Pl.*, 335, 1753.

This species is discussed in some detail in my previous paper (*B.E.C. 1938 Rep.*, 123/8, 1939). There is an important correction to the illustration of the valves there given, of which I did not see a proof. This was reduced from my original drawings, and the actual magnification is about ×6, not ×10 as labelled—the scale in millimetres is correctly reduced.

Life History (of subsp. *agrestis* (Fries) Danser).

Germination has occurred in my cultures from the end of April until mid-June, and again in September. It seems to occur most freely in May. Seeds which have remained on the parent plants throughout the winter germinate almost immediately when sown in spring. Plants take a year to reach maturity, and live to fruit for several years. After fruiting the crowns often produce large leaves in the autumn, and some leaves are to be seen almost throughout the winter months, fresh leaves appearing in abundance about the end of March or beginning of April. Flowering commences in mid-June and continues until late autumn.

Fruits placed in water soon sink and may germinate when sunk, as indeed they will also in the dark. The teeth on the margins of the fruits are probably useful in attaching them to mud adhering to animals or the boots of man.

R. obtusifolius is an agricultural pest like *R. crispus*, but its life-history differs considerably. Whereas *R. crispus* is a short-lived perennial germinating freely in most months of the year, *R. obtusifolius* is a much longer-lived perennial with germination occurring mainly in the spring.

618/7 & 8. R. SANGUINEUS L., *Sp. Pl.*, 334, 1753.

See *B.E.C. 1938 Rep.*, 128-132, 1939, for synonomy, exsiccata and discussion of subspecies.

Var. a. PURPUREUS Stokes.

Icones. Eng. Bot., t. 1533. Moss, *Camb. Br. Fl.*, *2*, t. 148, 1914.

I am now convinced that the Witley plant discussed in the first part of these *Notes* (*loc. cit.*, 130) belongs to this variety, and that in cultivation the purple colouring of the veins becomes as well marked as in the Clifton, Guernsey and South London Botanical Institute plants. Material collected by myself and W. H. Spreadbury in April 1938 has been grown in our respective gardens through several generations and has remained constant apart from some intensification of the colour of the veins. As a final check on the constancy, seed from Spreadbury's plants were sown by me on April 16th, 1942, and immediately on germination, a month later, purple lines and blotches were conspicuous on the hypocotyls, cotyledons and young leaves. Moreover, one of my plants transplanted to the garden of the South London Botanical Institute soon became indistinguishable from the *purpureus* which has long been cultivated there.

Life History. Of 10 fruits placed in water on November 19th, 1938, 8 had sunk within eight hours, and the other 2 within four days. It therefore appears improbable that the plant is distributed by the agency of water. Germination probably occurs at any time when conditions are mild and moist—I have noted it in February, March, April, August and September—and no resting period is necessary. Seed 13 years old failed to germinate at all.

Var. b. VIRIDIS Sibthorp.

Icones. Moss, *Camb. Br. Fl.*, *2*, t. 150, 1914 (*ut R. condylodes*).

As stated in my earlier paper (*loc. cit.*, 133) this plant is very easily distinguished from the normal form of *R. conglomeratus*, but immature or intermediate forms are frequently difficult to name. The following comparison should therefore prove useful:—

R. sanguineus L. var. *viridis* Sibth.	*R. conglomeratus* Murr.
Stem usually almost straight.	Stem usually distinctly flexuous.
Lower leaves usually rather bright green when young.	Lower leaves usually rather dull green when young, often panduriform.
Panicle rather strict with branches making an angle of less than 20° (–45°) with the main stem.	Panicle open with usually numerous branches making an angle of 30°-90° with the main stem.
Only the lowest whorls subtended by leafy bracts.	Whorls subtended by leafy bracts for about 2/3rds of the length of the branches.
One fruiting valve bearing a light brown or reddish globular tubercle about 1.5 mm. in diameter, the other two valves devoid of tubercles or with them less developed than the primary one. The primary tubercle occupying almost the whole width of the valve, but less than ½ its length.	All three fruiting valves bearing a large (1.25-1.75 × .5-.75 mm.) oblong swollen tubercle, which is usually more than twice as long as broad and at maturity often exceeds ½ the length of the valves.
Nuts 1.25-1.75 × c. 1 mm., dark brown.	Nuts larger (1.75-2 × 1-1.25 mm.), reddish brown.

Life History. The fruits float rather longer in water than those of *purpureus.* For example, 10 fruits were placed in water on November 19th, 1938; 5 of them were still floating eight days later, all but one had sunk at the end of thirty days, but one remained floating until the following June 3rd. Germination has occurred in my garden in March, April, May, June, August and September, but probably occurs in nature in the largest numbers towards the end of April. Thus on May 10th, 1942, young seedlings were seen in myriads in the rides of the London Clay woodlands of Bookham Common, Surrey, and three weeks later they were numerous by a damp track on Buckland Hills. I have only once noticed wild seedlings in autumn. No waiting period is necessary before germination occurs.

618/9. R. CONGLOMERATUS Murray.

For synonomy, varieties, etc., see *B.E.C. 1938 Rep.*, 132, 1939.

Icones. Eng. Bot., t. 724; Moss, *Camb. Br. Fl.*, 2, t. 147, 1914 (as *R. glomeratus* subvar. *divaricatus*).

Additional Exsicc. 15, E. Kent; Hythe (283). 17, Surrey; Littleworth Common. 26, W. Suffolk; Risby (140).

Life History. There can be no doubt that the fruits are distributed by the agency of water, in which they are able to float for very long periods. For example, of 10 fruits placed in water on November 19th, 1938, all were still floating when the first two germinated on the following June 10th. Round the margin of ponds *R. conglomeratus* may often be seen to form a definite strand-line on one side—this presumably being the side and horizon to which the floating fruits are drifted by the prevailing winds or currents in autumn and winter. Light appears to be essential for germination which takes place in May and June.

618/10. R. **RUPESTRIS** Le Gall.

This species was discussed in *B.E.C. 1938 Rep.*, 134/6, 1939. To the distribution there given must now be added:—

9, Dorset; West of Lyme Regis, but just within the county boundary, 1923, A. W. Graveson (Hb Graveson). The specimen is rather young, but there is no doubt that it is *R. rupestris.* Mr Graveson took me in 1939 to the place where he had collected the plant, but building was taking place and we were unable to refind it.

The entry for v.-c. 9 in *Comital Flora* is probably based on the record for Ringstead Bay, Dorset, Green, teste Linton in *B.E.C. 1917 Rep.*, 126, 1918.

Life History. As might be expected from the size of the tubercles, the bouyancy of the fruits is very great. It is extremely rare for a fruit to sink in water, and repeated experiments have shown that it is usual for every fruit to remain floating until germination occurs. When the species occurs in dune-slacks which fill with water during the winter it commonly grows in "crescent-shaped communities" on the side of the slack to which the floating fruits are driven by the prevailing winter winds (Gilmour, *Journ. Bot.*, *71*, 16, 1933; Rilstone, *Ibid.*, 107; Lousley, *Journ. Bot.*, *73*, 259, 1935).

R. rupestris occurs frequently on rocky shores and at the base of cliffs, and since water-distribution in such cases would be by salt-water, some experiments were undertaken to ascertain whether contact with sea-water destroyed the viability of the fruits. For this purpose fruits collected at Kenfig during the previous summer were sown in pots on November 12th, 1938, after 10 of them had been shaken up with sea-water for 68 days, and another 10 shaken up with fresh water for a similar period to act as a control. Of the 10 which had been in sea-water, 2 germinated the following May, while 3 of those which had been in fresh water germinated about six weeks earlier. On March 5th, 1939, I planted 18 fruits which had been floating on sea-water for 181 days, and 10 germinated during the summer. On the same day I planted 36 fruits which had spent the same time floating on fresh water, and of these no less than 32 eventually germinated. From these limited experiments it appears that sea-water has some effect in destroying viability, but that even after six months over 50% of the seeds germinated. It therefore seems probable that *R. rupestris* is distributed by the fruits floating on the sea—a conclusion which is confirmed by the distribution of the plant on the uninhabited islands of the Scillies.

Germination has occurred in my London garden at various times from April 1st to early June. It can occur in darkness, but is greatly stimulated by light. The characteristic glaucous hue of the leaves is developed when they are very young.

618/11. R. **PULCHER** L.

This species was discussed in *B.E.C. 1938 Rep.*, 136/9, 1939, to which the following notes are supplementary.

Subsp. EU-PULCHER Rechinger fil.

In this, the common form of the species in Britain, leaves which are not constricted into the panduriform shape are more frequent than I formerly supposed. Plants grown in garden soil both at Streatham and at the South London Botanical Institute, from seed of wild plants with well marked panduriform leaves, produced leaves which showed only the slightest constrictions. It seems that in nature the panduriform leaves are best marked on dry sandy or chalky soils, and less evident when the plant grows in moister habitats.

Life History. In water the fruits sink within a very short time, and they are therefore most unlikely to depend on water-carriage for dispersal. For example, of 10 fruits placed in water on November 19th, 1938, 5 had sunk within 8 hours, 4 more 15 hours later, and the last one sunk on the third day. As this species possesses tubercles the result was rather surprising, but repeated experiments produced similar results. Germination takes place in the absence of light but is delayed.

Subsp. EU-PULCHER Rechinger fil.

I have seen material from the following v.-cc. in addition to those given in *B.E.C. 1938 Rep.*, 137, 1939:—v.-cc. 5, 7, 13, 28.

Subsp. DIVARICATUS (L.) Murbeck.

Additional material has been seen as follows:—

34, W. Gloucester; Wapping Wharf, Bristol, 1940, Brenan (6360) (Hb. Brenan).

61, E. Yorks.; King George Dock, Hull, 1937, Sledge (Hb. Sledge).

618/12. R. PALUSTRIS Smith. See *B.E.C. 1938 Rep.*, 139/142, 1939.

As this species is very frequently confused with *R. maritimus* the following translation of the excellent table of contrasting characters given by Murbeck (*Bot. Not.*, 1913, 211/2) should prove useful.

R. palustris.	*R. maritimus.*
Fruit-stalks rather thick and rigid; most of them not longer than the fruit valves.	Fruit-stalks fine and weak; most of them longer than the fruit-valves.
Outer perianth-segments herbaceous, somewhat coarse, longer than ½ the diameter of the inner and with claw-shaped forward-curved apices.	Outer perianth-segments thin, almost membranous, not longer than ½ the diameter of the inner, horizontally spreading or weakly reflexed.
Inner perianth-segments with narrower, but blunter, almost ligulate apices; their teeth rigidly setaceous and shorter than the segments; tubercle rather strongly elevated, ovate, obtuse in the front.	Inner perianth-segments with more triangular, sharper apices; their teeth delicate, of almost hair-fineness, all or at least some of them longer than the segment; tubercle less elevated, narrow lanceolate, acute in front.
Anther-length 900-1300 μ.	Anther-length 450-620 μ.

All these characters have been tested by application to British plants and confirmed. Those referring to the outer perianth-segments and length of the anthers are less easy of application than the others. Murbeck gave the measurements of anthers from dried material; they would probably be rather greater in each case if fresh anthers were measured.

Life History. The bouyancy of the fruits of *R. palustris* is very great, and on two separate occasions ten fruits all remained floating for over a year. Water-carriage must play a great part in their dispersal. In my garden germination has occurred in April, May, June, August and September. It occurs, but is greatly retarded, in the absence of light. Plants from seed sown in March 1938 flowered in 1939 and again in 1940: those from seed sown in August 1938 did not flower until 1940, and died immediately afterwards. On April 16th, 1939, at Southease, East Sussex, I saw fresh leaves on a crown which had fruited the previous season, and therefore feel convinced that in nature as in cultivation *R. palustris* may behave as a rather short-lived perennial, though the biennial state is more frequent.

Distribution. In addition to the v.-cc. already given I have seen material from v.-cc. 20, 26, 53, and 56.

618/13. R. MARITIMUS L. See *B.E.C. 1938 Rep.*, 142/5, 1939.

Life History. The fruits are certainly dispersed through the agency of water, and almost certainly also with the assistance of animals and man. In water they remain floating for a considerable time. Thus of 10 which were placed in water on November 19th, 1938, 2 sank after 35 days, and another on the 132nd day; the remainder continued floating for over a year. Germination has been observed in April, May, June, July, August and September: it occurs freely when the fruits are floating in tap-water, and is not affected by the absence of light. It is very intermittent, as one might expect of a plant which lives on such places as pond-margins which are not exposed throughout the summer every year. Thus of 60 seeds sown in March 1938, 20 had germinated by April 28th, about another 25 germinated in June after the pot which had dried up had been stood in water, and another 10 appeared in 1939. Under favourable conditions plants can undoubtedly persist through the winter: I have photographed the colony at Wennington embedded in thick ice on December 18th, 1938, and fresh and vigorous the following March 12th. In my garden a plant lived through the severe winter of 1939-1940 when it was subjected to a temperature almost continuously below freezing point from mid-December to February 4th. This ordeal did not prevent it from fruiting the following August. Germination can occur a few days after the fruits are removed from the parent plant.

Distribution. Pending publication of the full list of voucher material I have seen for the vice-comital distribution, it is desirable that the following should be put on record:—

*19, N. Essex; Dovercourt, 1877, Babington (Hb. Cantab.), and 1905, Sherrin (Hb. S.L.B.I.)—N.C.R.

20, Herts.; Totteridge, 1912, C. S. Nicholson (Hb. London)—to substantiate N.C.R. in *B.E.C. 1938 Rep.*, 145, 1939.

22, Berks., or 12, N. Hants.; Silchester Amphitheatre, Woods (Hb. Borrer), thus confirming Bicheno's record which is bracketed in Druce's *Fl. Berks.*, 430, 1897. The locality is well within the present boundary of Hampshire, but as it is consistently claimed for Berkshire by Druce it is likely that the county boundary here has been revised since Watson established his vice-counties.

618/18. R. BROWNII Campdera, *Mon. Rumex*, 64, 81, 1819.

Icones. Hayward & Druce, *Adv. Fl. Tweedside*, 210, fig. 64, 1919; Dammer in Engler-Prantl, *Naturl. Pflanzenfam.*, *3*, 1a, 17, t. 8, fig. R, 1892; Rechinger, in *O.B.Z.*, *84*, 49, t. 2, fig. 2, 1935.

Exsicc. R. Brown, No. 3007 (Hb. Kew)—teste Rechinger.

Perennial. Stem 25-60 cm., thin, rather flexuous, simple or slightly branched. Lower leaves narrow ovate or lanceolate, usually strongly constricted a little above the cuneate or cordate base, 5-17 cm. long, apex acute or obtuse, margin finely crisped. Upper cauline leaves much narrower and acute, often linear-lanceolate, sometimes hastate. Whorls remote, few (-6) flowered. Valves (2.3-3.5 × c. 2 mm.), deltoid, reticulated, often reddish, not tubercled, with 3-5 hooked teeth on each side usually exceeding half the width of the valve, the mid-nerve drawn out into an excurrent hooked apex.

R. Brownii is the only Australian species which belongs to the section *Axillares*, characterised by habitually producing secondary inflorescences from the axils of the primary shoot (see below under *R. salicifolius* aggr.).

The following material has been seen from Britain:—

63, S.-W. Yorks.; Waste ground, Bradford, September 11, 1917, J. Cryer (Hb. Druce)—*B.E.C. 1917 Rep.*, 246, 1918, and September 1921, G. C. Druce (Hb. Druce).

64, Mid-West Yorks.; Waste ground at Gibson's Tannery, Meanwood, Leeds, September 14, 1915, September 1916, August 3, 1918, E. C. Horrell (Hb. Sledge and Hb. Druce)—*B.E.C. 1916 Rep.*, 501, 1917; 1917, J. Cryer (Hb. Druce)—*B.E.C. 1917 Rep.*, 246, 1918; September 1921, G. C. Druce (Hb. Druce). See also Lees, Cheetham & Sledge, *Suppl. Yorks. Fl.*, 94, 1941.

79, Selkirk; Galafoot, near Galashiels, August 26, 1908 (Marked plentiful, 1908-1909-1910-1911-1912-1913), I. M. Hayward (Hb. Hayward & Hb. Druce); Galashiels, August 19, 1908, Jas. Fraser (Hb. S.L.B.I.).

80, Roxburgh; On the banks of the Tweed from the junction of the Gala to Melrose, "plentiful 1908, September 1909, 1910, 1911-12," I. M. Hayward (Hb. Hayward).

79, Selkirk, and 80, Roxburgh; Banks of Gala and Tweed, August-September 1911, "noticed 4 successive years," I. M. Hayward (Hb. Druce)—*B.E.C. 1911 Rep.*, 120, 1912. First recorded from Galashiels by Miss Hayward in *B.E.C. 1908 Rep.*, 350, 1909, but apparently found a few days earlier by J. Fraser (see above).

An account of its distribution will be found in Hayward & Druce, *Adv. Fl. Tweedside*, 211, 1919; I have failed to find it in searches in two recent years.

R. Brownii was thus found on Tweedside for at least six seasons (1908-1913), at Bradford in 1917 and 1921, and at Meanwood it probably persisted for at least seven seasons (1915-1921). The deep, horizontal root facilitated its spread and persistence.

On Tweed-side it was introduced in imported wool to which the hooked fruits had clung while the wool was still on the sheep's back. In Hb. Hayward there is a packet containing wool with masses of embedded fruits. Another sheet is marked "Found in New Zealand wool a piece of this *Rumex*," a statement which is of interest as the species is probably rare in New Zealand (cf. Rechinger, *loc. cit.*, 37).

In April 1912 Miss Hayward planted fruits extracted from the 1911 wool-clip, and dried one of the seedlings and mature plants which resulted. She found fruits in wool from Queensland and Adelaide, and the species flowered on Tweedside from September to November. The width and shape of the leaves varies considerably in British material, and indeed they do so in specimens from countries where it is native.

Distribution abroad. Native in Australia, Tasmania, Java, and probably New Zealand. Adventive in Germany and Switzerland, probably introduced in wool in all cases.

618/19. R. SALICIFOLIUS Weinmann in *Flora 4*, 28, 1821.

This species was recorded as new to Britain by J. A. Wheldon in *Journ. Bot., 51*, 280, 1913, and since that date the name has frequently appeared in our literature. Weinmann's name was used until recently to cover a considerable number of species which have recently been clearly defined, illustrated and arranged by Rechinger fil. (*Field Mus. of Nat. Hist., Bot. Series, 17*, No. 1, 1-151, 1937). None of the British material appears to be conspecific with *R. salicifolius* Weinm. sensu Rech. (of which Rechinger has examined the type specimen in Copenhagen Herbarium), and probably all, or almost all, of it belongs to *R. triangulivalvis* (Danser) Rech. fil. (see below). A third segregate, *R. altissimus* Wood, has been recorded, but probably in error (see below).

The three plants may be distinguished by the following key:—

1 Leaves ovate-lanceolate, broadest below the middle; valves more than 4.5 mm. long .... *R. altissimus* Wood.

1. Leaves usually narrower, lanceolate or linear-lanceolate; valves smaller, usually less than 3 mm. long.
    2. One valve only bearing a tubercle which occupies nearly the whole breadth of the valve; valves only 2.3-3 mm. long .... *R. salicifolius* Weinm. (restr.).
    2. Valves usually all bearing tubercles which are much smaller (the margin of the valve on both sides of the tubercle at least as broad as the tubercle; valves about 3 mm. long .... *R. triangulivalvis* (Danser) Rech.

618/19. (Substituted name.) R. TRIANGULIVALVIS (Danser, *Nederl. Kruid. Arch.*, *1925*, 415, 1926) Rechinger fil., *Fedde Repert.*, *40*, 297, 1936, and *Field Mus. Nat. Hist.*, *Bot. Ser.*, *17*, No. 1, 58, 1937; *R. salicifolius auct. mult.*—non Weinm.

Icones. Danser, *loc. cit.*, 415, t. 1, fig. 1 and 2; Rechinger, *loc. cit.*, t. 10.

Exsicc. 17, Surrey; Eastfields, Mitcham, 1928, Lousley (F.22) (Hb. Mus. Brit.; Hb. S.L.B.I.; Hb. Lousley, teste Rechinger; etc.).

Perennial, 30-50 cm., with several erect flexuous stems which are often decumbent at the base. Leaves all of a characteristic pale green colour, of papery texture when dried, linear-lanceolate, gradually narrowed to both ends, acute, shortly petioled or subsessile. Panicle with a few simple arcuate-ascending branches; as each panicle passes into fruit a fresh flowering shoot grows up from a lower axil and eventually exceeds the primary panicle, only to be exceeded in turn by a third panicle—and so on. Whorls congested above, distant below, the lower subtended by long linear leafy bracts. Fruiting valves c. 3 × 2 mm., rather thin, olive, deltoid, entire or finely denticulate, reticulate; all three valves bearing an elongate muricate tubercle, which occupies only about one quarter of the total width of the valve.

The production of secondary panicles from the axils of leaves below the primary panicle is a very conspicuous feature of this species which does not occur in any of our native Docks. The character is typical of section *Axillares* Rechinger, *loc. cit.*, 6, one of the two primary sections into which he divides the subgenus *Lapathum*, and which is mainly represented by North American species. Unlike most Docks, *R. triangulivalvis* does not develop radical leaves after the seedling stage.

Life History. In my garden the species germinates freely in April and May, and fruits in August and September of the same year. It then continues as a perennial—one culture has fruited annually for four seasons and is still alive. Ten fruits from my Eastfields gathering all germinated when sown five years after collection.

Occurrence in Britain. I give below all the specimens and records which I have seen, but it is possible, though unlikely, that the list may include segregates of *R. salicifolius* aggr. other than *R. triangulivalvis*. Specimens have been seen only from those localities for which herbaria are cited.

1a, Scilly; Tresco (Hb. D.-S.), unlocalised, 1926, Miss Dorrien-Smith (Hb. Kew).

3, S. Devon; Plymouth Dockyard, 1930, German (Hb. Kew); Sampford Spiney (Huckworthy), German—*Fl. Devon*, 571, 1939.

9, Dorset; Swanage Camp, 1917, Green (Hb. Druce)—*B.E.C. 1917 Rep.*, 126, 1918.

10, Isle of Wight; Newport, 1929, Long (‡Hb. Druce and ‡Hb. Lousley, teste Rechinger)—*B.E.C. 1927 Rep.*, 416, 1928; *1929 Rep.*, 239, 1930; and *1931 Rep.*, 759, 1932); Hort. ex Newport, 1929, Drabble (Hb. Druce & Hb. Mus. Brit.).

11, S. Hants.; Swaythling, 1918, Rayner (‡Hb. Druce)—a forage introduction, *B.E.C. 1918 Rep.*, 398, 1919.

17, Surrey; Eastfields, Mitcham, Lousley (F.22) (‡see above)—*B.E.C. 1934 Rep.*, 985, 1936; Thameside near Hammersmith, Brown—*B.E.C. 1922 Rep.*, 746, 1923; By Thames, Mortlake, 1932, Woodhead (‡Hb. Woodhead).

18, S. Essex; Dagenham & Grays, Melville & Smith—*B.E.C. 1927 Rep.*, 453, 1928; Dagenham, 1937, Brenan (4078) (‡Hb. Brenan); Tilbury, 1926, Melville (Hb. Wales).

19, N. Essex; Colchester, 1923, Brown (Hb. Druce & Hb. S.L.B.I.), the specimens are immature, and the leaves rather broad—*B.E.C. 1923 Rep.*, 403, 1924; Colchester, Druce—*B.E.C. 1924 Rep.*, 595, 1925.

20, Herts.; Hertford, Graveson (Hb. Druce)—*B.E.C. 1920 Rep.*, 146, 1921; Ware, 1928, Druce (‡Hb. Druce)—*B.E.C. 1928 Rep.*, 757, 1929.

21, Middlesex; Temple Fortune, 1910, Cooper (Hb. Cantab.—as *R. elongatus* teste Moss); Uxbridge, Lady Davy—*B.E.C. 1921 Rep.*, 396, 1922.

22, Berks.; Twyford, 1924, Evans (Hb. Wales); Twyford Mill, 1925, Mrs Wedgwood (‡Hb. Druce)—*B.E.C. 1925 Rep.*, 893, 1926; Didcot, 1927, Druce (Hb. Druce)—*B.E.C. 1927 Rep.*, 587, 1928, and *1929 Rep.*, 135, 1930.

23, Oxon.; Waste ground, Iffley Road, Oxford, 1900, Druce (Hb. Druce); Chipping Norton, 1921, Druce (Hb. Druce)—*B.E.C. 1921 Rep.*, 396, 1922; Port Meadow, Oxford, Gambier Parry—*B.E.C. 1925 Rep.*, 893, 1926.

25, E. Suffolk; Woodbridge, Shaw (‡Hb. Druce)—*B.E.C. 1924 Rep.*, 595, 1925.

34, W. Gloucester; Baptist Mills, 1917, Sandwith—*B.E.C. 1932 Rep.*, 356, 1933; St Phillips, 1918, Miss Todd (Hb. Druce)—*B.E.C. 1918 Rep.*, 398, 1919; St Phillips, Sandwith—*B.E.C. 1919 Rep.*, 678, 1920; Avonmouth, Sandwith—*B.E.C. 1928 Rep.*, 757, 1929; Ashley Hill, 1936, Brenan (2825) (‡Hb. Brenan).

39, Staffs.; Burton-on-Trent, Druce & Curtis—*B.E.C. 1926 Rep.*, 131, 1927; [but Burton-on-Trent, 1929, Druce (Hb. Druce)—*B.E.C. 1929 Rep.*, 135, 1930, is immature and certainly incorrectly named].

41, Glamorgan; Splott, Cardiff Docks, introduced with grain siftings, *B.E.C. 1925 Rep.*, 1023, 1926, and *1933 Rep.*, 725, 1934; Rubbish-heap, Cardiff E., Smith & Woodhead (‡Hb. Woodhead)—*B.E.C. 1939/40 Rep.*, 293, 1942.

58, Cheshire; Ridge Hill, Stalybridge, 1914, Collier (Hb. Druce); By Mill, Birkenhead Docks, 1939, Miss Todd (Hb. Todd & Hb. Lousley).

59, S. Lancs.; Walton, Wheldon, collected 1912 (Hb. Mus. Brit.), 1913 (Hb. Mus. Brit. & Hb. Druce), and 1914 (Hb. Mus. Brit. & ‡Hb.

Druce)—*Journ. Bot.*, *51*, 280, 1914; *B.E.C. 1913 Rep.*, 335 and 495, 1914, and *1914 Rep.*, 159, 1915.

61, S.E. Yorks.; Hull Docks, 1922, Miss M. Cobbe—*B.E.C. 1922 Rep.*, 746, 1923.

69, Walney Isle, Miss M. Cobbe—*B.E.C. 1924 Rep.*, 595, 1925.

76, Renfrew; 77, Lanark; 99, Dumbarton; Recorded for these three v.-cc. by Grierson in *Glasgow Nat.*, *9*, 44, 1931. There are specimens collected by Grierson in 1919 and 1920 in Hb. Druce—*B.E.C. 1920 Rep.*, 146, 1921. Glasgow, no collector given (‡Hb. Druce). Grierson's specimens are likely to have come from Possil (v.-c. 77) or Bowling (v.-c. 99).

76, Renfrew; Newlands, Glasgow, J. R. Lee (Hb. Lee, teste Lee).

77, Lanark; Possilpark, J. R. Lee (Hb. Lee—immature, teste Lee).

83, Mid-Lothian; Slateford, 1920, Fraser (Hb. Druce)—*B.E.C. 1921 Rep.*, 396, 1922.

H.21, Dublin; Dublin, Grierson—*B.E.C. 1919 Rep.*, 678, 1920.

Nearly all the published records included in the above appeared under the aggregate name *R. salicifolius*, and those which I am quite certain are *R. triangulivalvis* are marked "‡" against the herbarium in which I have seen specimens. Of the North American species included in the aggregate name, only one other has appeared in Europe as an adventive—*R. altissimus* Wood, which has been found a very few times in Denmark and Sweden, whereas *R. triangulivalvis* has frequently been found in Sweden and Denmark, and less often in Norway, Holland, Switzerland, Germany, etc. In Britain the latter has occurred as an adventive about docks, railways, rubbish dumps, and once in a clover field. It is usually introduced with grain.

Distribution abroad. North America, throughout most of Canada and U.S.A. with the exception of the extreme north and south. Adventive in Europe (as above).

618/20. R. PATIENTIA L., *Sp. Pl.*, 333, 1753 (correcting citation in *B.E.C. 1938 Rep.*, 145, 1939).

This species is discussed in some detail in the first part of these *Notes*, to which the following records are additional:—

Subsp. EU-PATIENTIA Rech. fil.

5, S. Somerset; Well established in waste ground between Minehead and the Warren and also growing on the adjacent stony shore, June 17, 1942, Lousley (Hb. Lousley).

Subsp. ORIENTALIS (Bernh.) Danser.

17, Surrey; Ham Gravel Pits (where it has been known to Mr N. Y. Sandwith for several years), July 1942 (Lousley 120). It is possible that the plant has spread from here to the localities at Chiswick and Mortlake further down the Thames.

Life History. *R. Patientia* has germinated in April, May and August in my garden, and takes a year to attain the flowering state. Individual plants can live for at least five seasons (1938-1942), and may well have a much longer life.

Use. This species has long been used as a vegetable, the leaves being grown as an alternative to Spinach. The war having revived an interest in uncommon vegetables, the seed of *R. Patientia* is now (February 1943) being widely advertised for sale as "Herb Patience." It is not unlikely that an increase in its distribution in Britain may result!

618/21. R. BUCEPHALOPHORUS L., *Sp. Pl.*, 336, 1753.

Icones. Beck in Rchb., *Icones, 14*, t. 187, 1904; Coste, *Fl. France, 3*, fig. 3126, 1906; Heukels, *Plantenatlas*, 109, fig. 1, 1925.

Type Specimen. Herb. Linn. No. 21 marked "13. *bucephalophorus*" in the handwriting of Linnaeus.

Annual. Stems thin, ascending, often spreading at the base. Ground leaves spathulate; cauline leaves small, ovate or lanceolate, cuneate or attenuate at the base. Inflorescence a simple raceme, pedicels reflexed, much thickened towards the base of the fruiting perianth. Valves (2-4 × 1-1.5 mm.), with 2-3 teeth on each side, each with a minute swelling which is scarcely a tubercle.

Life History. In my garden seed germinated freely in April and May for several years, fruit appeared in June and July, and the plants died in early autumn. Three generations appeared from seed ripened by the earlier plants, and even the exceptionally cold winters experienced did not kill the seeds which remained in the soil.

Distribution. I have seen the following material:—

10, Isle of Wight; Newport, J. W. Long (Hb. Druce)—see *B.E.C. 1927 Rep.*, 416, 1928, and *1931*, 759, 1932. Mr Long informs me that it appeared on two occasions.
20, Herts.; Ware, Druce (Hb. Druce)—see *B.E.C. 1917 Rep.*, 126, 1918.
41, Glamorgan; Barry, 1927, Druce (Hb. Druce) and R. L. Smith (Hb. Wales)—see *B.E.C. 1927 Rep.*, 416, 1928, and *1938*, 81, 1939.

It has also been recorded from:—

76, Renfrew; Bishopston Coup, Grierson, *Glasgow Nat.*, *9*, 44, 1931.
83, Mid-Lothian; Leith Docks, Fraser ex Grierson, *loc. cit.*

Material from Elland, v.-c. 63, September 1916, leg. E. C. Horrell (Hb. Sledge) so labelled, is not this species, but is insufficient for certain determination.

In this country *R. bucephalophorus* is a rare adventive.

Distribution Abroad. All round the Mediterranean coast, Canaries and Azores.

Dr Rechinger was working on the segregates of this very variable species in 1939, and after the war it may be possible to name the British material more precisely.

(.618/23. R. HALOPHILUS F. von Mueller, *Fragm. Phytogeogr. Austral.*, *4*, 48, 1863-4.

This species is regarded by Rechinger as a synonym of *R. crystallinus* Lange. All the British material formerly referred to *R. halophilus* is undoubtedly *R. tenax* Rech. fil., which is discussed below.)

618/23. (substituted name) R. TENAX Rechinger fil., in *O.B.Z.*, *84*, 40, 1935; *R. halophilus* auct. austral. p.p.

Icones. Rechinger *loc. cit.*, *49*, t. 2, fig. 5 (from Roxburgh material collected by Miss Hayward in Hb. Kew).

This species has probably only been found once in Britain:—

80, Roxburgh: On an embankment by the side of the Tweed below Galashiels, August to September 1911, I. M. Hayward (Hb. Hayward, Hb. Druce, Hb. Kew). Fruits ripened well, and the material is very good. Thellung examined material in January 1914 and wrote, "*Rumex* cf. *halophilus* F. Muell. species mihi ex descr. tantum nota." The record as *R. halophilus* F. Muell. appeared in the *B.E.C. 1913 Rep.*, 335, 1914, where the county of origin is erroneously given as Selkirk. A description is given with the record in Hayward & Druce, *Adv. Fl. Tweedside*, 211, 1919.

R. halophilus is also recorded from Gibson's Tanyard, Meanwood in Lees, Cheetham & Sledge, *Suppl. Yorks. Floras*, 94, 1941, but I have seen no material and confusion with the very narrowed leaved form of *R. Brownii* which occurred there is to be suspected.

R. tenax bears some slight resemblance to *R. maritimus* L., but the remote whorls (internodes 3-4 cms.), the much fewer shorter teeth on the fruiting valves, and the elongated bright orange-coloured tubercles should prevent confusion.

Distribution Abroad. Known only from Australia (New South Wales and Victoria), whence it was doubtless introduced to Tweedside in wool.

618/24. R. CUNEIFOLIUS Campdera, *Mon. Rumex*, 95, 1819; *R. magellanicus* auct. angl. non Campdera, non Grisebach.

Icones. Rechinger fil., in *Arkiv f. Bot.*, *26a*, 20, fig. 8 and t. 5, 1933.

Exsicc. 41, Glamorgan; Kenfig Dunes (Lousley 155).

Perennial with a long (> 1 metre) woody rhizome, which in sand spreads horizontally at about 35 cms. below ground level, at intervals sending up shoots which attain a height of (15-) 25 (-30) cms. Leaves obovate, obtuse, often cuneate at the base, margins finely crisped and crenate, all very coarse and leathery. Panicle congested with a few short simple branches, secondary panicles sometimes arising from lower axils after the primary one has passed in fruit. Valves 4-5 × 2.5-3 mm., ovate-deltoid, rather acute, entire, coriaceous, all bearing a large elongate tubercle, the surface of which is finely punctate.

R. cuneifolius was first recorded for Britain in *B.E.C. 1913 Rep.*, 335, 1914, from v.-c. 58, Cheshire; Wallasey, 1913, where it is incorrectly stated to have been found by Dr J. W. Ellis. (See below.) In 1919 it was found near Glasgow by R. Grierson and reported as *R. magellanicus* Grisebach " named at Kew " (*B.E.C. 1919 Rep.*, 574, 1920). From this date it was frequently mentioned in British literature as *R. magellanicus* even after Danser had corrected the identification. As shown below, *R. magellanicus* Campdera (with which Grisebach's plant is synonomous) apparently does not occur in this country

Distribution in Britain. Recorded for the following v.-cc.:—

1, W. Cornwall; Phillack Towans, 1921, Thurston (Hb. Druce)—*B.E.C. 1921 Rep.*, 396, 1922 (near a mule camp), *1922 Rep.*, 621, 1923; 1934 and 1936, Lousley (Hb. Lousley); Thurston & Vigurs, *Suppl. Fl. Cornw.*; 121, 1922.

4, N. Devon; Braunton Burrows, 1929, F. R. E. Wright (Hb. Mus. Brit.); 1929, W. D. Miller (Hb. Druce)—*B.E.C. 1929 Rep.*, 135, 1930; 1931, Edmonds (Hb. Kew); 1932, " abundant for c. 300 yards at bottom of a deep hollow (from which it has not yet escaped) in middle of dunes," R. Meinertzhagen (Hb. Mus. Brit.); 1936, Lousley (Hb. Lousley); Keble Martin & Fraser, *Fl. Devon*, 25 and 571, 1939.

34, W. Gloucester: Avonmouth Dock, Sandwith (Hb. Druce)—*B.E.C. 1923 Rep.*, 210, 1924, and *1932 Rep.*, 357, 1933.

41, Glamorgan: Cardiff, 1925, Sandwith (Hb. Druce)—*B.E.C. 1925 Rep.*, 894 and 1023, 1926; *1926 Rep.*, 183, 1927. It was again collected by Mrs Sandwith from here in 1927, *B.E.C. 1938*, 81, 1939; Kenfig Sand-dunes, 1934, E. M. Thomas (Hb. Mus. Brit.)—*Journ. Bot.*, *74*, 56, 1936, and *B.E.C. 1936 Rep.*, 277, 1937.

58, Cheshire: On the sandhills at Wallasey, 1913, Snow & Barker (Hb. Kew). This record is given in *B.E.C. 1913 Rep.*, 335, 1914, on the authority of " Dr J. W. Ellis, ex W. G. Travis." Mr Travis informs me that he has no recollection of seeing a specimen and believes he was not connected with the record, his name having been added by Dr Druce in error. He has very kindly supplied references which explain how Dr J. W. Ellis' name was connected with the record although the plant was discovered by G. E. Barker. Dr Ellis exhibited specimens of *Rumex cuneifolius* as " new to Britain " at a meeting of the Liverpool Botanical Society on October 22nd, 1913 (*Proc. L'pool. Bot. Soc.*, 1913, and *Lancs. Nat.*, *6*, 305, Report for 1913-14), only three weeks after Dr W. B. Turrill had named Barker's specimens at Kew. J. A. Wheldon attributed the discovery to Dr Ellis in a paper on " *Some Alien Plants of the Mersey Province* " (*Lancs. Nat.*, *6*, 375), but corrected the name of the discoverer and the locality shortly afterwards (*Lancs. Nat.*, *6*, 402).

77, Lanark; Glasgow, 1919, Grierson (Hb. Druce)—*B.E.C. 1919 Rep.*, 574, 721, 1920. The locality was Gartcosh, where " hardly any " was left in 1928 (Grierson in *Glasgow Nat., 1919-30 Rep.*, 45, 1931). J. R. Lee informs me that he has a specimen collected in 1919, and that he believes it disappeared shortly after 1928. It occurred at Gartcosh for about 10 years. The determination was corrected to *R. cuneifolius* in *B.E.C. 1923 Rep.*, 62, 1924.

83, Mid-Lothian; Leith Docks, 1921, Jas. Fraser (Hb. Druce). There is a note on the sheet that it has existed for 20 years—*B.E.C. 1921 Rep.*, 396, 1922, and *1922 Rep.*, 621, 1923.

R. cuneifolius in its native habitats in South America has various habitats but especially favours maritime sand-dunes. In this country four of the stations (Phillack Towans near Hayle, Braunton Burrows, Kenfig dunes, and Wallasey sand-hills) are on coastal dunes, and at the first three of these localities the plant is very well established. As I showed in *B.E.C. 1936 Rep.*, 277, 1937, the plant may well have been introduced at Hayle with mule-fodder during the 1914-18 War, but the Braunton and Kenfig localities are so remote that it is very difficult to explain their origin. At these places *R. cuneifolius* may well have escaped notice for a very long period, and the dune-slacks now occupied may not have been so far from the sea when the plant first arrived.

In order to ascertain whether carriage by sea-water is likely I conducted a simple experiment. Having already ascertained that the fruits were able to float for a considerable period in fresh water, I placed 6 of them in a tube containing tap-water on March 21st, 1938. Of these 4 sunk in about three weeks, but the other two continued to float, and one of them is still floating at the time of writing—a little over 5 years later. The buoyancy in salt-water is almost certainly greater than that in fresh. On September 5th, 1938, I placed 10 fruits collected at Kenfig a few weeks earlier in sea-water, and another 10 fruits of the same gathering in tap-water. On November 12th, 1938 (after 68 days in water during which they were shaken up at frequent intervals), they were sown in pots in the garden. Of the 10 fruits which had been in sea-water, 7 germinated in May 1939, and 2 in May 1940. Of the 10 which had been in fresh water, 8 germinated in May 1939 and no further germination took place. It thus seems that viability is not reduced by immersion in sea-water, and that introduction of the plant by sea is possible.

At four other localities (Avonmouth, Cardiff, Glasgow, and Leith) *R. cuneifolius* has occurred in the company of many other adventives on well-known hunting grounds for aliens. Nevertheless, it persisted at Glasgow for about 10 years, and at Leith for over 20 years.

Life History. In my garden germination has occurred freely in May and again in September. No resting period is necessary. I have not succeeded in raising plants to maturity. On the dunes at Kenfig it appears to increase mainly by vegetative means. The stems beneath each rosette descend vertically for 35 cms. or more, and then throw out long horizontal rhizomes a metre or more in length which produce fresh rosettes at their extremities. It is not known to what depth the roots descend in search of water, but it is likely to be considerable, as also may be the power of vertical elongation in the event of submersion by blown sand. The tough leathery leaves suggest that the plant is well adapted to a xerophytic existence.

Distribution Abroad. *R. cuneifolius* Campd. is a native of Argentine, Chile, Peru, Bolivia and Uruguay. It has been recorded as adventive from U.S.A., Denmark, Holland and Germany.

(618/25. R. FLEXUOSUS [Solander] Forst. ex Sprengel, *Syst.*, *2*, 162, 1825.

Icones. Rechinger fil., in *O.B.Z.*, *84*, 49. t. 2 and fig. 8, 1935.

This species was recorded from Galashiels, Selkirk, by Miss I. M. Hayward in *B.E.C. 1914 Rep.*, 20, 1915, and in Hayward & Druce, *Adv. Fl. Tweedside*, 211, 1919. The name was cited as of Solander ex Forster, *Flor. ins. Austral. prodr.*, *90*, No. 515, 1786, but Rechinger has shown (*loc. cit.*, 45) that this was a *nomen nudum.*

The only specimen I have seen is the one in Herb. Hayward, which is immature. It is impossible to be certain on the evidence of the available material but I feel confident that Miss Hayward's plant is not the New Zealand *R. flexuosus* but rather the closely allied Australian *R. flexuosiformis* Rechinger fil.;, *O.B.Z.*, *84*, 46, and t. 2, fig. 9, 1935. This is distinguished from the former mainly by the much larger, longer stalked, fruiting perianths and larger nuts.

R. flexuosus "Solander" is also recorded from Gibson's Tanyard, Meanwood in Lees, Cheetham, and Sledge, *Suppl. Yorks. Floras*, 94, 1941. As there is a specimen of *R. Brownii* collected by F. A. Lees from the same locality in 1912 and originally labelled "*Rumex flexuosus* Soland." (Hb. Mus. Brit.) it is highly probable that the record is erroneous.)

(618/26. R. ALTISSIMUS Wood, *Class Book*, ed. 2, 477, 1847 (fide Rech.).

Icones. Britten & Brown, *Illustr. Fl. North. United States*, *1*, 549, 1896 (teste Rech.); Rech. fil., *Field Mus. Nat. Hist.*, *17*, 46, fig. 6, 1937.

This species is allied to *R. triangulivalvis* (Danser) Rech. fil., and has been distinguished from this species above. Material from v.-c. 58, Cheshire; Ridge Hill, Stalybridge, collected by F. Collier in 1914 (Hb. Druce) is immature, but the leaf outline is similar to that of *R. altissimus* and was so recorded in *B.E.C. 1914 Rep.*, 84, 1915. Material collected by G. C. Brown at Colchester in 1923 also has broad leaves, but until adequate material is available the species cannot be confidently included in the *British Plant List.*)

618/27. R. NEPALENSIS Sprengel, *Syst.*, *2*, 159, 1825.

Icones. Dammer in Engler-Prantl, *Naturl. Pflanzenfam.*, *3*, 1a, t. 8, fig. S, 1893; Rechinger fil., *B.B.C.*, *49*, t. 3, 1932.

I have seen only one undoubted specimen of this adventive from Britain:—

79, Selkirk; Tweedside, 1914, I. M. Hayward (Hb. Hayward). This material, which is well grown but not quite mature, was determined by Thellung in December 1915 and recorded in *B.E.C. 1915 Rep.*, 208, 1916, and in Hayward & Druce, *Adv. Fl. Tweedside*, 212, 1915.

R. nepalensis is remarkable for the hooked teeth which occur along almost the whole margin of the valves. This character is limited to very few species of *Rumex*, and *R. Brownii* is the only other Dock with hooked teeth which has occurred in Britain. In general habit *R. nepalensis* recalls *R. obtusifolius* and should not be confused with occasional specimens of that species having a few slightly hooked teeth on the valves.

Distribution abroad. From S.-W. China through Tibet, India, Persia and Syria to Asia-Minor. It also occurs in Java, N. Africa, the Balkans and Italy.

(618/30. R. MAGELLANICUS Campdera, *Mon. Rumex*, 71, 144, 1819; *R. magellanicus* Grisebach in *Abh. Kgl. Wiss. Göttingen*, *6*, 118, 1854 (teste Rechinger).

Icones. Rechinger fil., *Arkiv. f. Bot.*, *26a*, fig. 6, and t. 3, 1933.

This species is a native of South America like *R. cuneifolius*, from which it may be distinguished by the narrower and much more crisped leaves.

The name was misapplied to most of the early gatherings of *R. cuneifolius* from Glasgow, Leith and Cardiff, but corrected by Danser later (*B.E.C. 1923 Rep.*, 62, 1924, and *1936 Rep.*, 228, 1937). Gatherings made by Grierson at Glasgow in 1919, and by Mrs Sandwith at Cardiff in 1925, still remain in the *magellanicus* cover in *Herb. Druce*, but both are certainly *R. cuneifolius* Campd.

The species appears to be rare even in its native Argentine and Chile and is not very likely to occur as an adventive in Britain. Unless further evidence can be produced *R. magellanicus* should be deleted from the *British Plant List*.)

HYBRIDS.

Records of the hybrids collected prior to 1939 and distributed in my *Rumices Britannicae Exsiccatae* have already been published (*B.E.C. 1938 Report*, 152-5, 1939). Those listed below were mostly collected in the years 1939 to 1942 and have been distributed in the same series. Additions to *British Plant List*, ed. 2, are printed in heavy black type as before.

R. DOMESTICUS Hartm.
  × *obtusifolius* L. ssp. *agrestis* (Fries) Danser. 85, Kinross; Kinross (247). 88, Mid-Perth.; Fortingall (243).

R. AQUATICUS Linn.
  × **obtusifolius** L. ssp. **agrestis** (Fries) Danser. 86, Stirling; Shore of Loch Lomond, Balmaha (234).

R. CRISPUS L.

× *obtusifolius* L. ssp. *agrestis* (Fries) Danser. 1a, Scilly: "The Town," Bryher (332). 86, Stirling; Shore of Loch Lomond, Balmaha (237, 238).

× *sanguineus* L. var. *viridis* Sibthorp. 17, Surrey; Thames bank at Walton-on-Thames (290); Border of Holt Wood, Chelsham (293).

R. OBTUSIFOLIUS L.

× *Patientia* L. 21, Middlesex; Chiswick (203, 291).

R. OBTUSIFOLIUS L. ssp. AGRESTIS (Fries) Danser.

× **pulcher** L. ssp. **eu-pulcher** Rech. fil. 1a, Scilly; Middle Town, St Martin's (425). 17, Surrey Barnes Common (114).

× *sanguineus* L. var. *viridis* Sibthorp. 17, Surrey; Warlingham (294); Chelsham (292).

R. CONGLOMERATUS Murray.

× *pulcher* L. ssp. *eu-pulcher* Rech. fil. 15, E. Kent; Hythe (201, 220, 281, 282). 17, Surrey; Shalford Common (216, 217).

R. PULCHER L. ssp. EU-PULCHER Rech. fil.

× **rupestris** Le Gall. 1a, Scilly; Samson (272). 2, E. Cornwall; Whitsand Bay (228). 17, Surrey; As natural hybrid in garden of South London Botanical Institute (112).

× **sanguineus** L. var. **purpureus** Stokes. 17, Surrey; As natural hybrid in garden of South London Botanical Institute (113, 277).

HERBARIA CONSULTED.

The herbaria cited in *B.E.C. 1938 Rep.*, 154-5, 1939, with the addition of the following:—

Herb. B.-W.	Perth Natural History Museum—the collection of Francis Buchanan White White (1842-1894), who is usually referred to as Buchanan White.
Hb. Babington.	The Botany School, Cambridge—the collection of C. C. Babington, to which many additions have since been made (1808-1895).
Hb. Brenan.	Private collection of J. P. M. Brenan, Oxford.
Hb. Cantab.	The Botany School, Cambridge, including Hb. Babington (see above).
Hb. D.-S.	The private collection at Tresco Abbey, Scilly, maintained by Major Dorrien-Smith.
Hb. Ellis.	Private collection of A. E. Ellis, Epsom, of which the Rumices were shown to me by Mr E. C. Wallace.
Hb. Glasgow.	The herbarium of Glasgow University. The material has not been seen by me, but is occasionally cited for voucher specimens for vice-county records on the authority of Mr J. R. Lee, who sent me detailed notes.
Hb. Sandwith.	The private collections of Mrs C. Sandwith, Bristol, and Mr N. Y. Sandwith, Kew.

Hb. Sledge.	The private collection of Dr W. A. Sledge, Leeds, in which is incorporated the herbarium of E. C. Horrell.
Hb. Todd.	Material from the private collection of Miss E. S. Todd, Aldbourne, Wilts.
Hb. Woodhead.	The private collection of J. E. Woodhead, Tulse Hill, S.E.
Hb. Yorks.	The herbarium of the Yorkshire Philosophical Society, York. The material has not been seen by me, but is cited for a few vouchers for vice-county records on the authority of Mr E. C. Wallace, who kindly supplied me with notes.

Finally, I wish to acknowledge my great indebtedness to the owners and custodians of the numerous herbaria cited, and especially to the authorities at the British Museum (Natural History), the Royal Botanic Gardens, Kew, and the Druce collection of the University of Oxford, for the facilities they have placed at my disposal in these difficult times. Of the numerous correspondents who have assisted me with specimens, notes and references, special thanks are due to Capt. A. E. A. Dunston, Dr W. A. Sledge and Messrs John R. Lee, R. Mackechnie, W. G. Travis, and E. C. Wallace. To Mr A. J. Wilmott I am indebted for many suggestions and much help in preparing this paper for the printers. Communication with Dr Rechinger has, of course, been impossible, but the help which he gave so freely right up to the outbreak of war has been invaluable in the preparation of this paper. It is to be hoped that the co-operation of Continental botanists may be available again in the not too distant future.

ORNITHOGALUM UMBELLATUM L.

C. E. Britton, A.L.S.

The plant-forms included under the above specific name have received little attention from critical botanists in Great Britain, perhaps from the view that in localities where seen the Star of Bethlehem is of obvious or suspected garden origin. There are localities, however, where this plant has appeared to observers to be a genuine native of Britain, where conditions have not supported the view that it was derived from garden escapes or "throw-outs." Thus, Druce in *The Flora of Berkshire* recorded *O. umbellatum* L. as growing in great quantity in an upland meadow between Watchfield and Shrivenham, where it had the appearance of an indigenous plant. Even if it is assumed that the species has no claim to the status of a native plant, yet it must be admitted that it has been long present in the land, the first record dating from the 16th century, when the species was noted growing by the river Thames near Shene in Surrey. Shene is, of course, the present-day Richmond, and whether it still grows there is unknown, but there are records of it in more modern, and indeed present, times at localities by the R. Thames above Richmond. An earlier generation of British botanists set great value on the works of the leading French botanists of the middle of the 19th century, in whose works appeared several species derived from the splitting-up of the Linnean *O. umbellatum.* Thus, in the *Flore du Centre de la France*, 3rd edition, 1857, of A. Boreau, appeared descriptions of *O. umbellatum* L., *O. angustifolium* Bor., *O. affine* Bor., and *O. divergens* Bor. In the *Flore de France,* vol. iii, of Godron and Grenier, was a description of another species, *O. pater-familias* Godron. Many new species allied to *O. umbellatum* L. were described by Jordan and Fourreau in the *Breviarum Plantarum Novarum*, published in 1866. Ignoring those species not of French citizenship and others considered by later botanists to be allied to species other than *O. umbellatum* L., the following species remain: *hortense, Boreanum, rusticum, cespititium, parviflorum, tardans, proliferum*, and *declinatum.* These species were founded by Jordan and Fourreau on aggregations of minute characters derived from all parts of the plants. None of the species enumerated have been maintained by later botanists. In the *Flore de France*, vol. xii, of Rouy, whilst some are given varietal rank, others are cited as synonyms. The arrangement of the French forms by Rouy is as follows: Subspecies 1—*campestre* Rouy with var. *hortense* = *O. hortense* Jord. & Fourr.; var. *angustifolium* = *O. angustifolium* Bor. = *O. parviflorum* Jord. & Fourr.; var. *affine* = *O. affine* Bor.; var. *tardans* = *O. tardans* Jord. & Fourr. Subspecies 2—*divergens* Bor. (pro. sp.); var. *declinatum* = *O. declinatum* Jord. & Fourr. Between the two subspecies is placed the "Race" *O. paterfamilias* Godr. (pro. sp.).

In studying the descriptions of the French authors, a term is encountered for which an exact equivalent can not be found in British botany. Thus the bulbs may produce " cayeux " or alternatively " bulbilles " (Boreau; Grenier and Godron), or, both " caïeux " and " bulbilles " (Rouy). We do not appear to possess a term corresponding to Cayeux (or caïeux)* but the word seems to indicate bulbils which remain attached to the parent bulb and develop both leaves and flowering stems (scapes). The existence of caïeux does not seem to have been recognised in British *O. umbellatum* L. It had not escaped notice that plants occurred with wide or narrow leaves, for Babington in the first issue of the *Manual of British Botany* described the leaves as " linear and longer than the stem or filiform and shorter than it," and Bromfield in the *Flora Vectensis* (1856) recognised a var. β distinguished by " leaves very slender, linear-filiform, flowers few, 3-5." In the 3rd edition of *English Botany* Syme recognised two varieties, α *genuinum* = *O. umbellatum* of Boreau *Fl. du Centre*, ed. iii, vol. 2, p. 624, with the characters " leaves broadly linear spreading—recurved when young, flowers 5-12," and β *angustifolium* = *O. angustifolium* Bor., *l.c.*, 625, " leaves very narrowly linear, erect when young (Boreau), flowers 3-5 . . . . var. β in the Isle of Wight in several places (?)"—(see *Fl. Vect.*, p. 501). It is uncertain what value may be placed upon the terms in which Bromfield characterised the Isle of Wight plant, as no French author credits any form of *O. umbellatum* L. with possessing leaves that could be described as equivalent to linear-filiform. If the plant of the *Flora Vectensis* was correctly described, then it was probably a form that nowadays would not come within the limits of *O. umbellatum* L.

A summary is given of the chief characters of the species described by Boreau. *O. umbellatum* L.—Caespitose, bulbs producing " cayeux " which bear leaves and scapes. Leaves linear, broadly channelled, with a white band down the middle, longer than the scapes, prostrate. Upper bracts longer than pedicels and flower-buds, the lower bracts rather shorter than pedicels. Pedicels at first erect-spreading, later ascending or slightly curved. Perianth-leaves lanceolate sub-obtuse. Capsule with six prominent angles. Flowers in May. *O. angustifolium* Bor.—Caespitose bulbs producing " cayeux " which bear leaves and scapes. Leaves linear, narrowly channelled, with a whitish furrow at the centre, erect when young, equalling or exceeding the scapes. Bracts at first longer than pedicels, later less than half as long. Pedicels ascending. Perianth-leaves oblong. Flowers May to June. *O. affine* Bor.—Related to *O. angustifolium* Bor. but not identical. Caespitose, bulbs producing " cayeux " bearing tufts of linear narrowly channelled leaves, slightly curved and always spreading in a rosette, as long or shorter than scape, appearing later than in *O. angustifolium* Bor. Bracts longer than pedicels and sometimes exceeding flowers, finally not half as long as pedicels. Flowers 2-3 weeks later than *O. angustifolium*, at the end of May and in June. *O. divergens* Bor.—Plant not caespitose, bulbils not producing leaves whilst attached to parent-bulb. Leaves linear elongated, with a broad central white band. Bracts much shorter than pedicels. Pedicels elongated, erect at first, finally divaricate and declining, curved at the apex. Flowers large, 4 to 5 cm. in diameter, perianth-leaves elliptical. Capsules with 6 prominent angles. Flowers April to May. No measurements of the organs appear in the descriptions of Boreau. Those given by Rouy for his two subspecies are transcribed for comparison with the measurements given later for British plants. *O. umbellatum* subsp. *campestre* Rouy = *O. umbellatum auct. mult.*—Leaves 3-4 mm. broad, pedicels 3-4 cm. long, perianth-leaves 16-20 mm. long. *O. umbellatum* subsp. *divergens* (Bor.) Rouy—Leaves 4-5 mm. broad, pedicels 5-6 cm. long, perianth-leaves 20-25 mm. long.

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*The English equivalent is " clove "—cf. cloves of garlic, etc.—ED.

It is by no means unlikely that most of the foregoing segregates of *O. umbellatum* L. occur in Britain and that intensive study would reveal their presence. Plants from a few localities have been cultivated for some years past and some interesting points have become apparent regarding the times of leaf-appearance and opening of the flowers. That the period of flowering differed in the various forms was made known by Boreau, but I am unacquainted with any observations concerning the seasons at which the leaves appear above the soil. In plants from more than one locality the leaf-points appear at the surface of the soil from December to February, and the leaves develop in the spring; in another form the leaves appear in the previous autumn and after attaining a certain length in that season further growth ceases, the leaves persist through the winter and growth is renewed in the following spring, when maximum length is attained. The forms hitherto under observation appear to belong to *O. umbellatum* L. emend. Bor. and to *O. angustifolium* Bor. Detailed descriptions of both forms follow.

O. UMBELLATUM L. emend. Bor.

Bulbs ovoid, 25 × 16-19 mm., with 2-3 leafless bulbils enclosed within tunic. Leaves linear, 18-25 cm. long, 4-6 mm. wide with a central white stripe 1-1¾ mm. wide, shallowly canaliculate. Scape 13-17 cm. long, inflorescence 4-flowered; bracts three-quarters as long as pedicels when flowers first expand; pedicels erect-ascending never becoming divaricate, 20-25 mm. long, lengthening, and finally attaining a length of 40 mm. Flowers when fully expanded 46 mm. in diameter, outer perianth-leaves elliptical-lanceolate, 25 × 8 mm., green externally with white marginal bands 2 mm. wide, inner perianth-leaves 23½ × 7 mm. externally with a central green stripe 1 mm. wide and white marginal bands 3 mm. wide. Filaments oblong-lanceolate acuminate. Ovary 6-lobed, lobes equidistant, later becoming arranged in three pairs.

Growing in compact masses. At a Surrey locality a colony has been seen 4½ feet in diameter. During the resting season the leafless bulbils still adhere to the parent-bulb. In the growing season that follows, the bulbils are free from the tunic, bear one radial leaf, but are still attached to parent-bulb. The leaves pierce the soil from late December to early February according to the mildness or severity of the weather and make little growth until the winter is past. They are usually prostrate and exhibit signs of withering before the first flowers expand. Flowers very sparingly produced, first opening in the second or third week of May or at beginning of June. Fruit unknown. After flowering, the ovary grows to some extent, but fails to produce seed.

This form does not appear identical with any of the species described by Jordan and Fourreau.

O. ANGUSTIFOLIUM Bor.

Bulbs oval-ovoid, with leafless bulbils enclosed within tunic. Leaves narrowly linear, 20 cm. long, 2-3¾ mm. wide with a central rather indistinct whitish stripe, canaliculate-plicate. Scape 12 cm. long, inflorescence 5-6-flowered or up to 10-flowered (in cultivation); bracts all less than half as long as pedicels when flowers first expand; pedicels erect at first, then spreading-erect, later becoming widely-spreading, and, after flowering, divaricate, but not declining, 55-65 mm. long. Flowers when fully expanded 53-58 mm. in diameter, perianth-leaves striated, pale-green externally, outer perianth-leaves elliptical-oblong, 30 × 8 mm., white marginal bands 1 mm. wide, inner perianth-leaves oblong, 28 × 7 mm., white marginal bands 2 mm. wide. Filaments oblong, later becoming triangular, attenuate towards the apex. Ovary 6-lobed, lobes equidistant, finally arranged in three pairs.

Plants scattered. The leaves pierce the soil in the month of October and continue to grown during the autumn. After attaining a length of about 10 cm. growth ceases before the arrival of winter, and is renewed again during the spring. The leaves are oblique-erect at first, curving outwards above. At the commencement of the flowering period they are still fresh, erect or more or less prostrate. The flowers expand in the period commencing the last week of April to the second week of May and are usually faded before the flowers of *O. umbellatum* L. emend. Bor. expand. In cultivation fruit is not matured, the ovary enlarges but eventually withers. Differs from *O. angustifolium* Bor. in habit and in larger flowers but appears not distinguishable otherwise. Cannot be identified with any one of the species described by Jordan and Fourreau.

REVIEW.

John Ray, Naturalist, His Life and Works. By CHARLES E. RAVEN, D.D. Cambridge: The University Press, pp. xix + 502, 1942; 30s net.

The name of John Ray should be familiar enough to British amateur botanists, for few men have been responsible for so many important " first records " in our County and Local Floras. Many authors of these books have recognised the value of Ray's work by the inclusion of biographical notes and the more important of these include those in the Floras of Essex (Gibson, 444/6, 1862), Middlesex (Trimen & Dyer, 373/4, 1869), Bristol (White, 57/60, 1912), Berkshire (Druce, cxvii/cxxi, 1897), Kent (Hanbury & Marshall, lxii/lxiii, 1899), Cambridgeshire (Babington, vii/ix, 1860, and Evans, 9/10, 1939) and there are shorter notices in the Floras of Cornwall (Davey, xxxi, 1909), Westmorland (Wilson, 70, 1938), and Devon (Keble Martin & Fraser, 770, 1939). Ray was author of the first British local flora (*Catalogus Plantarum circa Cantabrigiam nascentium*, 1660), and his production of the first systematic Flora of Great Britain (*Synopsis Methodica Stirpium Britannicarum*, 1690) is a further claim to our interest and respect. But, as Dr Raven so clearly shows, Ray's influence on the course of botanical study was far wider than these examples indicate.

For various reasons the work of John Ray (1627 to 1705) has long failed to receive the recognition which is its due, and the first work to do full justice to him has taken 237 years from the date of his death to appear. The reasons for the neglect of Ray are several, and perhaps the most important so far as recognition in his own country is concerned is the fact that his principal works were written in Latin just at the time when it was becoming fashionable to write in English. Dr Raven's volume, giving the essence of them all, will remove the obstacle of language to obtaining a knowledge of Ray for those who know little Latin, but it cannot give them the joy of reading the wonderful composition of the original.

Another reason for the neglect of John Ray undoubtedly lies in the introduction of the binomial system by Linnaeus only 48 years after his death, an innovation which almost immediately led to the eclipse of the cumbrous names employed by Ray. In a useful note comparing the merits of these two great botanists (pp. 306/7), Dr Raven suggests that " Ray had the truer appreciation of the real task of a scientist," and later in his book (p. 453) he again stresses the point that the whole emphasis of Linnaeus' work was on nomenclature. Ray's wider view resulted in a less artificial classification than that of the renowned Swede and it is to be remembered that his publications were used as a quarry by the later worker. If only Ray had thought of the advantages of a simple binomial system the progress of British Botany would have been greatly accelerated.

Whatever the reason for the neglect of Ray—and neglect there has been, for an audience of experienced naturalists fairly gasped when his name was put forward as perhaps the greatest English naturalist at a "Natural History Brains Trust" only a year ago—there can be no doubt that Canon Raven has made amends. He clearly reverences Ray as a hero and an infectious enthusiasm runs right through the book. With a fine working knowledge of plants, birds, insects, fishes, mammals, and of geology, with an intimate contact with Cambridge, its University, town and surrounding country, and following the same profession of divinity, there is no doubt that Dr Raven had unique qualifications for writing a book on John Ray, and that he has made the best of his opportunities.

The book opens with a masterly Preface followed by a list of "main sources," an "Epitome of Ray's Life," and dates of the publication of posthumous works. A separate list of publications giving full titles and brief bibliographical details might well have been added here. The first chapter is headed "Boyhood and Youth" and the original research done by the author is at once apparent and a number of corrections to previous biographies are given. With the aid of a 1″ Ordnance map the reader will derive a very clear picture of the little hamlet of Black Notley, both as it is to-day and as it appeared in Ray's time. A plan of the district would have been useful but this perhaps would not be permitted during the war. There is not very much to see at Black Notley now in the way of buildings connected with John Ray, but there is clearly sufficient of interest to justify a B.E.C. visit when excursions are resumed after the war.

The second chapter describes Ray's early life at Cambridge while his studies were still of the general nature usual at the time, and the third unfolds the development of his interest in Natural Science. We then come to the *Cambridge Catalogue* published in 1660, the first British local Flora and the foundation of Relhan's, Babington's, and Evans' Floras of the county, with entries of some species from adjacent counties, for Ray did not define his boundaries as modern writers do. Many entries such as *Caucalis daucoides* and *C. latifolia*, *Roemeria hybrida*, *Senecio paludosus* and *S. palustris* will raise envy in the hearts of modern flower hunters. Other good plants may still be found in the old localities. *Veronica spicata* was rediscovered recently "probably on the self-same spot" as that known to Ray (p. 93). The Cambridge Catalogue clearly showed in its incipient stages the important characteristic which distinguished all Ray's work from that of most of his predecessors, so many of whom were content merely to copy and to accept hearsay with the utmost credulity. Ray's later works are full of his own observations, his highly developed scientific acumen leading him to rely on his own observations and to challenge, or at least examine with a critical eye, the statements which had previously been copied from book to book, however manifestly absurd or superstitious they might be.

It was this spirit of original research which inspired the "Years of Travel," in Britain and on the continent, which are described in Dr Raven's fifth chapter. Here field botanists will find much to interest them and they will follow Ray in his itineraries with understanding and his researches with interest. He found *Lithospermum purpureo-caeruleum* near Denbigh, where our member Mr J. A. Whellan has recently seen it; near Bristol he saw *Trinia glauca*; on the beach "near Pensance" there were *Diotis maritima* and *Euphorbia Peplis*, and *Eryngium campestre* was noticed near Plymouth at the spot where I saw it in 1938. In the following chapter later journeys in England are described, and we may still see many of the plants he enjoyed in Craven, the Lakes, and elsewhere. One wonders whether the *Hieracium* with beautifully marked leaves which Ray noted at Cuckfield (p. 143) may not be the *H. Boffeyanum* recently described by Pugsley (*Journ. Bot.*, lxxix, 197, 1942) which was collected by Mr Wallace and myself in 1933 less than four miles from that place. The first fruits of these excursions appeared in the *Catalogus Angliae* published in 1670. Widening experience led to dissatisfaction with the chaotic lack of system which characterised existing works on Botany, and Ray's earlier attempts at classification were followed by *Methodus Plantarum* in 1682, which is carefully analysed by Dr Raven (pp. 192 to 200).

Chapter IX opens with a further description of Black Notley and of the life there, which Ray had resumed in 1679. In 1686 and 1688 he published his largest work, the monumental *Historia Plantarum*, which described over 6100 different plants, besides giving much general information. In such a veritable encyclopaedia of the flora of the known world it is only to be expected that native British plants should play a somewhat secondary rôle, but only two years after the publication of the second volume Ray produced the first systematic British Flora.

His *Synopsis Methodica Stirpium Britannicarum* was preceded by a small 32-page *Fasciculus* to the earlier *Catalogus Angliae* and this included early notices of many well-known rarities such as *Helianthemum polifolium* from Brean Down, *Geranium lancastriense* from Walney Island, and some of the treasures of Snowdon, St Vincent's rocks, and Breidden Hill. To the *Synopsis* itself one wishes that Dr Raven had devoted a little more space, though perhaps he is wise in dwelling throughout his book more especially on Ray's rarer works, which his readers are less likely to possess. Unfortunately, the edition of the *Synopsis* which can most often be bought is the third, which was edited by Dillenius after Ray's death and contains some additions which were not made by the great naturalist.

Examination of the *Synopsis* soon reveals the genius of its author, and one example of this is seen in the skill with which he distinguishes between plants which are genuine natives and introductions. *Tordylium maximum* he suspected of being a reject from gardens; *Erigeron canadensis*, which was frequent about London, he thought certainly not indigenous, while *Rumex sanguineus* var. *purpureus* he noted as "*hortorum rejectamentis originem suam debere suspicor.*" Ray gives popular names as known to him and it may be wondered why some of them have become changed or ignored by subsequent writers. Surely "Ducks-meat" is more expressive than the modern "Duck-weed."

The final botanical chapter in Dr Raven's book is entitled "Last Work in Botany" (pp. 271-307), and includes Ray's "Six Rules for Classification," most of which, and especially the first, still ring true to-day. The remaining chapters contain little Botany and are devoted to Ray's other widespread interests, but nevertheless the botanist should read and enjoy them. There is one illustration of the limitless enthusiasm of the great naturalist which field botanists who have stayed at a famous inn in Newmarket will miss in these pages. But perhaps this story relating apparently to the *Hemiptera-Heteroptera* is untrue; reference to the *Historia Insectorum* would decide.

Many of Ray's friends and correspondents are discussed in the course of the book and readers will find much interesting information about those who assisted him to make this what Linnaeus called "the Golden Age of Botany." Of these Thomas Willisel, the "tramping plant-collector," an unlettered man who could live upon oatcake and buttermilk like his successor Don; Petiver, that curious character who has earned everlasting fame as an example of how boundless energy in collecting can lead only to indifferent results if not coupled with a true scientific spirit; and Lhwyd, whose extensive searches in the Welsh mountains led to such rich discoveries, are some of the most interesting.

Dr Raven has used Ray's botanical publications (only the most important of which can be mentioned here) as a framework around which to write his life. The result is that the unfolding of his botanical ideas is clearly revealed and fresh light is thrown on his works; the experiment is thus well justified. It must be admitted, however, that the mass of detail introduced into the narrative on the appearance of each publication rather obscures the actual life of the naturalist. The size and price of the book will prevent many of the less affluent naturalists from owning it, and it is felt that Canon Raven has left room for another book on his hero. With the life considered first as a shorter, less rambling story, followed by the works considered individually, with plans of Black Notley and of the route taken on the various itineraries, and a few illustrations, a book would be produced which would have a very wide appeal, and it is hoped that Dr Raven will find time to write it.

In any case *John Ray, Naturalist, His Life and Works* will long remain a standard work. It will send its readers hastening to the original volumes on which it is based, and students of Ray's works will hasten to that of Canon Raven for elucidation. No higher praise can be given than to say that the book does justice to its subject and that its production in time of war reflects the highest credit on author and publisher alike.

J. E. LOUSLEY.

ABSTRACTS FROM LITERATURE.

[Those responsible for these Abstracts are indicated as follows:—[H.]=H. A. Hyde; [Wa.]=A. E. Wade; [Wi.]=A. J. Wilmott.

When only one entry is made in this Report from a single paper the full reference is given with the entry, in order to avoid both unnecessary printing and cross-reference: the usual method of citation by reference to the Bibliography is retained when more than one reference is made to the same paper.

Note to contributors. It would be a great convenience to the Editors if contributors would send in their Abstracts, and any necessary References for the Bibliography, on slips of uniform size, the size desired being 8 inches by 4 inches, the long edge to be treated as the top of the page. A separate slip for each item permits the easy sorting of the MS. without the transcription which is otherwise too often necessary in the preparation of copy for the printer. The uniform slips can be easily filed and will be available for future reference, thus enabling the Editors to avoid repetition and to make helpful references to previous notes.—Ed.]

GENERAL.

(A) BIOLOGY.

Germination.—Wattam (1941) records some observations on the germination of the seeds of *Lupinus polyphyllus* L. and on the seedlings of *Echium vulgare* L. and *Juncus effusus* L. In the lupin he found that seed stored for two or three years showed a higher percentage of germination than that sown in the season following their production.—[Wa.]

Seedling Mortality and Survival.—Salisbury, E. J. (1942: *Trans. Herts. Nat. Hist. Soc.*, xxi, 311-313) discusses "Some Observations on Seedling Mortality in the Winter of 1940-41." *Helianthemum Breweri* only survived because of its intermittent germination; the seeds germinated in batches, some in late autumn, some in early spring and others in late spring. Simultaneously germinating species, such as *Erodium moschatum*, may be completely exterminated by the direct or indirect action of frost. Survival of the less hardy winter annuals may occur owing to the enforced dormancy of seeds that have been buried and subsequently brought to the surface. The mortality of such a hardy species as *Trifolium minus* amounted to over 25 per cent.—[Wa.]

Pollination.—Dallman (1941B) records some observations on the pollination of, and insect visitors to, *Epilobium angustifolium* L., *Gagea lutea* (L.) Ker-Gawler and *Hydrocotyle vulgaris* L. In the latter species there was a distinct lack of insect visitors and effective autogamy is doubtless frequent.—[Wa.]

Light and Growth.—From a study of "The Effect of Light on Growth Habit of Plants," Langham, D. G. (1941: *Amer. J.B.*, xxviii, 951-956) concludes that the probable major cause of prostrate growth habit is aversion to light of high intensity (negative phototropism); all the common prostrate plants used in the study were negatively geotropic [i.e. tending to be erect] in darkness.—[Wi.]

(B) ECOLOGY.

ROOT SYSTEMS.—The root habits of several British species—*Rumex crispus*, *Plantago major*, *Solanum nigrum*, *Medicago lupulina*, *Chenopodium album*, *Taraxacum officinale*, *Sonchus asper* (also the aliens *Lepidium virginicum* and *Amaranthus retroflexus*) are figured by Cole, H. E., and Holch, A. E. (1941: The Root Habits of certain Weeds of South-eastern Nebraska; in *Ecology*, xxii, 141-147). The root habits of *Polygonus viviparum* and *Silene acaulis* are described and figured by Daubenmire, R. F. (1941: Some Ecologic Features of the Subterranean Organs of Alpine Plants; in *Ecology*, xxii, 370-378).—[Wi.] Holch *et al.* (1941) describe the root habits of certain plants of the Rocky Mountain National Park. Among the plants dealt with are *Dryas octopetala* L., *Epilobium angustifolium* L., *Achillea Millefolium* L., *Veronica alpina* L., and *Stachys palustris* L. Muller (1941) describes the rhizomes of some prairie plants, including *Phalaris arundinacea* L. and *Poa pratensis*.—[Wa.]

WOODLANDS.—Tansley, A. G. (1940: *Forestry*, xiv, 1-21) discusses the "Natural and Semi-natural British Woodlands."—[Wa.]

OAK WOODS.—Fenton, E. Wyllie (1941: The Oak in Scotland, and two semi-natural Oak Woods in the south-east of Scotland; *Forestry*, xv, 76-85) describes, with an account of the vegetation, the Dalkeith Palace Oak Wood, Edinburgh, and the Elibank Castle Oak Wood, Peebles.—[Wa.]

BEECH WOODS.—Examples of the survival of regeneration and of normal development of beech woods are few. Survival depends primarily on the ground and soil conditions prevailing at the time of seed fall. Beech seedlings are very sensitive to drought and survival only takes place if the primary roots are able to penetrate through the leaf litter and humus to the mineral soil below. The existence of any depth of undecomposed leaves results in the seedling radicles developing laterally in the moist litter and in the seedlings dying in the first summer drought. Secondarily, survival depends on sufficient light and moisture for effective physiological activity.—Bourne, R. (1942: A Note on Beech Regeneration in Southern England; *Journ. Forestry*, xxxvi, 42-49).—[Wa.]

PINE FORESTS.—Penistan, M. J. (1942: *Journ. Forestry*, xxxvi, 59-69) discusses the prehistory, recent history and present condition of "The Caledonian Pine Forest."—[Wa.]

GRASS HEATH.—Watt, A. S. (1940: Studies in the Ecology of Breckland; IV, The Grass Heath; *J. Ecol.*, xxviii, 42-70) discusses the vegetation of the so-called "grass heath" of Breckland in relation to the seven soil types recognized. Variation in floristic composition is shown to be primarily related to the soil and secondly to other factors (e.g. grazing by rabbits).—[Wa.]

HILL PASTURES (*Festuca-Agrostis* and *Molinia* associations).—" The Effect of Manuring, Grazing and Cutting on the Yield, Botanical and Chemical Composition of natural Hill Pastures: II, Chemical Section," is discussed by Davies, R. O. (1941: *J. Ecol.*, xxix, 49-61): the chemical effects of the soil which result from the application of fertilisers and from controlled sheep grazing are set out, but not the effects on the associations themselves.—[Wi.]

CHALK GRASSLAND.—Hope-Simpson, J. F. (1940: Studies of the Vegetation of the English Chalk; VI, Late Stages in Succession leading to Chalk Grassland; *J. Ecol.*, xxviii, 386-402) gives an account of the late stages of succession on spoil banks of a quarry on War Down, formed 40-55 years ago on old arable land, and at Coulter's Dean, abandoned for the last 50 years; both on the Hampshire-Sussex border. He (1941: Studies of the Vegetation of the English Chalk; VIII, A Second Survey of the Chalk Grasslands of the South Downs; *J. Ecol.*, xxix, 217-267) also discusses the results of a second survey, in 1935 and 1936, of forty-seven areas of Chalk-grassland of the South Downs, where records were made by Tansley and Adamson in 1920 and 1921.—[Wa.]

OVERGRAZING.—The effects on the soil of overgrazing of prairie are set out by Daubenmire, R. F., and Colwell, W. E. (1942: " Some Edaphic Changes due to Overgrazing in the Agropyron-Poa Prairie of South-eastern Washington; in *Ecology*, xxiii, 32-40). The tall perennial grasses become replaced by dwarf annuals, resulting in increased water-accumulation in winter, decreased soil aeration, decreased ability of soil to absorb water, and changes in the soil organisms and soil chemistry. —[Wi.]

FEN.—Wicken Fen (29, Cambs.). H. Godwin (1941: *J. Ecol.*, xxix, 83-106) continues his " Studies in the Ecology of Wicken Fen " with an account of " IV. Crop-taking Experiments": the *Molinietum* and the *Cladio-Molinietum* which afford the crops appear to have been themselves produced (or stabilised as a " deflected succession ") by the yearly and 3- or 4-yearly cuttings respectively.—[Wi.]

BOG.—" The ' Mosses ' (Sphagneta) of the Stainmore District " are described by W. H. Pearsall (1941: *J. Ecol.*, xxix, 161-175): they occur on gentle slopes (less than 1 in 30) of the Pennines, in an annual rainfall of about 55 inches, and have normally a soil pH of between 3.8 and 4.0; burning and grazing lead to the production of *Callunetum* and *Eriophoretum*.—[Wi.] A comparison of six bog areas at Nacarrigeen, Kylemore (three phases), Shinanagh, and Doo Lough (burnt) is given by Pearsall, W. H., and Lind, E. M. (1941: " A Note on a Connemara Bog Type; in *J. Ecol.*, xxix, 62-68).—[Wi.]

SALT-MARSH.—Chapman, V. J. (1941: Studies in Salt-marsh Ecology, Section VIII; *J. Ecol.*, xxix, 69-82) describes succession to be observed on the salt-marshes of Norfolk and the British Isles generally. The general vegetation is controlled primarily by the character of the soil, the east coast marshes possessing a more or less firm clay, the south coast a soft silt, the west coast much sand and the Irish marshes forming a kind of peat. There is evidence that under suitable conditions there is development to reed swamp and hence a woodland or other climatic climax is potentially possible.—[Wa.]

SAND DUNES AND SALT MARSH.—Lambert, J. M., and Davies, M. R. (1940: *J. Ecol.*, xxviii, 453-464) describe the vegetation of " A Sandy Area in the Dovey Estuary," Cardiganshire.—[Wa.]

ARABLE LAND.—Wattam (1941) records some observations made on the weed flora of new ploughed land in the Huddersfield district (v.-c. 63).—[Wa.]

QUARRIES.—Hepburn, I. (1942: The Vegetation of the Barnack Stone Quarries; *J. Ecol.*, xxx, 57-64) describes the vegetation of Oolitic Limestone quarries in Northamptonshire: a complete list of species observed is given.—[Wa.]

COAL DUMPS.—Pugsley, D. J. (1941: *Proc. Swansea Sci. and Field Nat. Soc.*, ii, 159-177) discusses the colonization and subsequent flora of the coal dumps at Cwmbach, Aberdare, Glamorgan.—[Wa.]

BOMBED SITES.—Shove, R. F. (1942A: *School Nature Study*, xxxvii, 58-59) gives an account of the flora in August 1942 on the site of four adjacent houses in the Kew area destroyed by bombing in the autumn of 1940 and cleared a few months later, and (1942B: *Nature*, cl, 463) reports the occurrence of *Buddleia variabilis* on the site of bombed houses at Kew.—[Wa.]

BRECONSHIRE: Cribarth Mountain.—Watkins, H. (1941: Some Ecological Problems on the Limestone of Cribarth Mountain; *Proc. Swansea Sci. and Field Nat. Soc.*, ii, 141-159) deals especially with the limestone dump, the quarry, and the distribution of *Molinia coerulea* on the north-west slope. Notes are given on several species emphasizing the characters of particular importance in relation to conditions in the area.—[Wa.]

(C) TOPOGRAPHICAL.

SOMERSET.—*The Proceedings of the Somerset Archaeological and Natural History Society* for 1939-1941 (1940-1942) contain a number of additional records. (1940: lxxxv. 230-5; lxxxvi, 139-144; 1942. lxxxvii, 118-124.—[Wa.]

WILTSHIRE.—*The Reports of the Marlborough College Natural History Society* for 1939, 1940 and 1941 contain the usual " Flower List " of interesting records and phenological observations; pp. 16-17, 10-12 and 11-12 respectively. Welch and Grose (1942) contribute a large number of new localities for Wiltshire plants.—[Wa.]

ESSEX.—Brown, G. C. (1940: Additional Records of Essex Plants; *Essex Nat.*, xxvi, 184-193, 248-255) includes a considerable number of adventives. Graddon, W. D. (1941: Stray Notes on Some Essex Plants; *Essex Nat.*, xxvii, 114-115) adds a few records. Ross, J. (1942: *Essex Nat.*, xxvii, 164-166) contributes notes on " Some Interesting Plants of Epping Forest." Lister, G. (1942: The Flora of Wanstead Park District; *Essex Nat.*, xxvii. 121-138) deals with changes in the district and its flora, and lists the plants now found there.—[Wa.]

HERTFORDSHIRE.—Salisbury, E. J. (1940: The Phanerogamic Flora of Bricket Wood; *Trans. Herts. N.H.S.*, xxi, 159-161) gives a brief description, with a list of plants, of the scrub community of Bricket Wood. Harrold (1942) records the occurrence of four segregates of *Viola arvensis* L. and *V. tricolor* L. in arable land under grass until the end of 1940. Pugsley, H. W. (1941B: Arable Weeds in East Herts.; *J.B.*, lxxix, 105-109) discusses and enumerates weeds near Sawbridgeworth, East Herts.—[Wa.]

Oxfordshire.—Britton (1942) publishes some plant notes; *Rhinanthus calcareus* Wilmott is recorded from Watlington Hill, and from Pyrton.—[Wa.]

Buckinghamshire.—Britton (1942) publishes some plant notes. *Valerianella carinata* Loisel, from Fingest and between Fingest and Turville, is recorded as new to the county.—[Wa.]

Northamptonshire.—Allen, H. G. (1940, 1941: Botanical Notes; *J. Northants. N.H. Soc.*, xxix, 171; xxx, 26-27) gives some new records for the county.—[Wa.]

West Gloucestershire and North Somerset.—Sandwith, C. I. (1940, 1941, 1942: Bristol Botany in 1939, 1940, 1941; *Proc. Bristol N.S.*, ix, 21-26, 89-92, 287-291) reports on the progress of botany in the Bristol district and gives details of a large number of interesting new records. —[Wa.]

Staffordshire.—Boydon Ridge, W. T. (1940, 1941: Report of the Botanical Section; *Trans. N. Staffs. F.C.*, lxxiv, 44-45; lxxv, 16-17) and Edees, E. S. (1942B: Report of the Botanical Section; *Trans. N. Staffs. F.C.*, lxxvi, 24-26) in their reports for the N. Staffs. Field Club, publish a number of new records for the county. Edees contributes some plant notes and records for 1941. Edees also (1942A) gives an account of the species of *Euphrasia* in the northern part of the county.—[Wa.]

Shropshire.—L. C. Lloyd (1940A) gives the history of the occurrence of *Scheuchzeria palustris* L., and (1940B) contributes some notes on the status and distribution of the orchids. Dallman (1940A: Botany (of Shropshire); *Caradoc and Severn Valley F.C.*, Record of Bare Facts; No. *49*, 4-13) and E. R. Lloyd (1942: Botany (of Shropshire); *op. cit.*, No. *51*, 3-5) enumerate new records made during 1939 and 1941 respectively.—[Wa.]

Carmarthenshire and Pembrokeshire.—For records, including some new to the county, see Whellan (1942A).

Cardiganshire.—For records, some new to the county, see Whellan (1942A). Stephenson (1942A) gives a note on the Dactylorchids.—[Wa.]

Cheshire.—Dallman and Williams (1940) discuss the occurrence of *Azolla filiculoides* Lam. Ecological notes, together with a complete list of plants observed, are given by Britten, H., Newton, P., and Wild, S. V. (1941: The Natural History of the Ballast Hole, Sinderland, Cheshire; *N.W. Nat.*, xvi, 40-56).—[Wa.]

Anglesey.—Wilson, A. (1940B: Some Plants of Anglesey; *N.W. Nat.*, xv, 104-109) gives a brief account of the flora.—[Wa.]

S. LANCASHIRE.—Stansfield (1940) deals with the occurrence of *Brassica juncea* (L.) Coss. in the Liverpool and Martin Mere district, S. Lancashire.—[Wa.]

NORTH-EAST YORKSHIRE.—Flintoff, R. J. (1941-3: The Natural History of Goathland; III, The Flowering Plants and Ferns. An Ecological Study; *N.W. Nat.*, xvi, 57-75, 164-182, 287-304; xvii, 229-244, 366-380; xviii, 87-102, 194-204) gives an ecological study of the flowering plants and ferns of Goathland. The treatment is ecological—the species being arranged under habitat headings, with notes on frequency, soil preferences, status, etc.—[Wa.]

SOUTH-WEST YORKSHIRE.—Sledge, W. A. (1941: Thorne Waste Plants; *Naturalist*, No. *796*, 266-268) gives a brief account of the present state of Thorne Waste, once the richest locality for marsh plants in the north of England, with references to some of the rare plants which grow or grew there. The disappearance of the rarer species from the area is attributed to former peat-cutting.—[Wa.]

MID-WEST YORKSHIRE.—Pickard, J. F. (1941: *N.W. Nat.*, xvi, 319-321) gives " Comments, with Addenda and Corrigenda on the Vegetation of Craven in Wharfedale," by the late Dr F. Arnold Lees.—[Wa.]

CUMBERLAND.—Muirhead, C. W. (1940B: Aliens and Adventives at Silloth; *N.W. Nat.*, xv, 70) records several adventive species, the presence of which is due to the spreading of ballast from cargoes of grain.—[Wa.]

MID EBUDES.—Harrison (1941) details the distribution of the American element in Coll, which he describes as the headquarters of this element in the Hebrides.—[H.] Harrison *et al.* (1941C) publish " The Flora of the Isles of Coll, Tiree and Gunna . . ." in which a considerable number of new records for the vice-county are made, including **Viola canina* L. and *V. canina* × *Riviniana*, which as records for 1941 should have been deferred, see *1939-40 Rep.*, p. 269, in which records " coll." should read " Coll," **Saxifraga hypnoides* L. (cf. our *1939-40 Rep.*, p. 245), and **Lycopus europaeus* L. (from which the * should be removed in the account of our excursion to Mull—*1939-40 Rep.*, p. 246).

N. EBUDES.—Rhum. For further records see Harrison, J. W. H. *et al.* (1941A).

OUTER HEBRIDES.—Atkinson (1940: *Trans. Bot. Soc. Edin.*, xxxiii, 52-60) contributes " Notes on the Botany of North Rona and Sula Sgeir," the results of a visit in July to August 1936. Twelve new records for North Rona are added to the thirty-five species observed by R. M. Barrington in 1885, and two to the five observed by Malcolm Stewart in 1933. J. W. H. & H. H. Harrison and Clark (1941B) publish some notes on the flora of the Isle of Harris. The new varieties, *Rubus incurvatus* Bab. var. *minor* W. Wats., *Rosa glaucophylla* Winch var. *rupicola* Heslop Harrison, and *Anthemis nobilis* var. *discoidalis* Heslop Harrison, are described.—[Wa.] Harrison (1941) reports the discovery of a new " focus " of arctic-alpine species in South Uist and records additional localities for "southern" species.—[H.] "The Preliminary Flora of the Outer Hebrides" (see *1939-40 Rep.*, 411) was not published till 1941.

(D) DISTRIBUTION.

POST-GLACIAL HISTORY OF BRITISH VEGETATION. [H.]

(a) Pollen Analyses and other data are recorded from the following areas:—

Somerset.—Godwin, H.; 1941: Studies of the Post-Glacial History of British Vegetation; IV, Correlations in the Somerset Levels; *New Phyt.*, xl, 108-132.

Hampshire.—Godwin, H., and Godwin, M. E.; 1940: Submerged Peat at Southampton. Data for the Study of Post-Glacial History, V; *New Phyt.*, xxxix, 303-307.

Huntingdonshire.—Godwin, H.; 1942: A Middle Bronze Age Palstave from buried forest at Woodwalton Fen, Hants. Data for the Study of Post-Glacial History, VIII; *New Phyt.*, xli, 165-170.

Glamorgan.—Fox, Sir Cyril, and Hyde, H. A.; 1939: A second Cauldron and an Iron Sword from the Llyn Fawr Hoard, Rhigos, Glamorganshire; *Antiq. J.*, xix. Hyde, H. A.; 1940: On a Peat Bog at Craig-y-llyn, Glam. Data for the Study of Post-Glacial History, IV; *New Phyt.*, xxxix, 226-233. Godwin, H.; 1940A: A Boreal Transgression of the sea in Swansea Bay. Data for Study of Post-Glacial History, VI; *New Phyt.*, xxxix, 308-321.

Denbighshire.—Bibby, H. C.; 1940: The Submerged Forests at Rhyl and Abergele, North Wales. Data for the Study of Post-Glacial History, III; *New Phyt.*, xxxix, 220-225.

Meath.—Mitchell, G. F.; 1942: A Composite Pollen Diagram from Co. Meath, Ireland; *New Phyt.*, xli, 257-261.

England and Wales.—Godwin, H. (1940B: Pollen Analysis and Forest History of England and Wales; *New Phyt.*, xxxix, 370-400) shows that the pollen zonation established in the Fenland is applicable to the whole country. The following zones are distinguished:—VIII, Alder-oak-elm-birch-(beech) zone; VII, (a and b) Alder-oak-elm-lime zone; VI, (a, b, and c) Pine-hazel zone; V, Pine zone; IV, Birch-pine zone.

(b) Fruits and Seeds:—

Kent.—Conolly, A. P. (1941: A Report of Plant Remains from Minnis Bay, Kent; VII, Data for the Study of Post-Glacial History; *New Phyt.*, xl, 299-303) lists 37 kinds of seeds (largely ruderal species) from a Late Bronze Age site in Minnis Bay, Kent. [*Coriandrum sativum* L., of which a single fruit (figured) was found, is the most interesting of the species.]

Altitudinal Range.—Wilson, A. (1940A: *N.W. Nat.*, xv, 41-50) contributes "Further Notes on the Altitudinal Range of British Plants."—[Wa.]

Wild Plant Conservation.—Ramsbottom, J. (1941: Preservation of the British Flora; *Nature*, cxlviii, 554-7) discusses plant conservation in Britain in the light of broad ecological principles.—[H.]

(E) GENETICS.

Lewis, D. (1941: Male Sterility in Natural Populations of Hermaphrodite Plants. The equilibrium to be expected between females and hermaphrodites with different types of inheritance; *New Phyt.*, xl, 56-63) discusses the possible mechanisms whereby equilibrium might be established between females and hermaphrodites in "gynodioecious" species: cytoplasmic male sterility, which occurs in all such species fully investigated, only requires a slight advantage of the females to be effective.—[H.]

(F) CYTOLOGY.

CHROMOSOME NUMBERS.—Maude, P. H. (1940: Chromosome numbers in some British Plants; *New Phyt.;* xxxix, 17-32) has made chromosome counts of 55 species of British plants previously uncounted; she has confirmed the counts made by earlier authors in 10 species and has obtained in 7 species counts which differ therefrom. A Supplement to the Merton Catalogue (Rutland, J. P., 1941: The Merton Catalogue. A List of Chromosome Numbers of British Plants. Supplement No. 1; *New Phyt.*, xl, 210-214) records chromosome counts of 37 species, newly counted by the author, and of 54 compiled from various sources.—[H.]

(G) NOMENCLATURE.

POPULAR NAMES.—A. W. Johnston (1939: Derivation of some Orkney Plant-Names; reprinted (pp. 1-11) from *Miscellany of the Viking Society*, x) deals with 20 names. Usages of interest to the general British botanist are "Blackberry" for fruit of *Empetrum*, and "Dochen" for the Dock [the latter more widespread as "Docken"].—[Wi.]

(H) TAXONOMY.

CLASSIFICATION.—Matthews, J. R. (1941: *Trans. Bot. Soc. Edin.*, xxxiii, 69-81) in his Presidential Address to the Botanical Society of Edinburgh dealt with "Floral Morphology and its Bearing on the Classification of Angiosperms."—[Wa.]

"SUBSPECIES" AND "VARIETY."—The meaning of these terms is discussed at length by Clausen, R. T. (1941: *Rhodora*, xliii, 157-167), and the discussion is continued by Fosberg, F. R., and Weatherby, C. A. (1942: *Rhodora*, xliv, 153-167).—[Wi.]

SYSTEMATIC.

6. RANUNCULUS. Parkin (1940A: *N.W. Nat.*, xv, 3-12) discusses "The Glossy Petal of the Buttercup," dealing with the British yellow-flowered species.—[Wa.]

6/9. RANUNCULUS ARVENSIS L. Burkill, I. H. (1941: An Ontogenetic Analysis of *Ranunculus arvensis* Linn.; *J.B.*, lxxix, 121-131) finds that the phyllotaxy throughout this species is on a 2/5ths spiral, which is continuous through the cotyledons, leaves, sepals, petals, stamens and carpels. In a spring-sown crop it was usually the ninth of these emergencies which was the first sepal, but if there were nine leaves (the cotyledons counting as leaves) then the tenth became the first sepal. In an autumn-sown crop from the same lot of pure-line seed the leaves varied from seven to thirteen. Much information is given concerning the development of the leaves, and their areas are tabulated. The effects of mutilations are set out, and malformations of sepals and stamens are described.—[Wi.]

6/25. Ranunculus peltatus Schrank. The method of nectar secretion from the petal nectary is described by Cubitt, R. (1942: *Naturalist*, Nos. *802-805*, 113-116).—[Wa.]

RHOEADALES. A study of the origins of vascular bundles in the torus, and of nectary characteristics, appears to indicate criteria useful in the phylogenetic study of the genera and families. It seems that *Resedaceae* and *Capparidaceae* are the most primitive, probably derived on parallel lines from an ancestral stock, the *Papaveraceae*, *Fumariaceae* and *Cruciferae* being developed later, again on parallel lines, from a stock somewhat resembling existing *Resedaceae* and *Capparidaceae*. Norris, T. (1941: Torus Anatomy and Nectary Characteristics as Phylogenetic Criteria in the Rhaeadales; *Amer. J.B.*, xxviii, 101-113).—[Wi.]

21/1. Papaver somniferum L. Melville, R. (1941: *Gard. Chron.*, cix, 54) suggests that the Opium Poppy might be cultivated in Britain as a source of oil, and (1942: *Gard. Chron.*, cxi, 187-188) gives a report of cultivation experiments at Kew and Twickenham. Warne, L. G. G. (1941: *Gard. Chron.*, cx, 229-230) reports the results of growing seeds obtained from a chemist. Owing to drought 36 instead of the expected 50 reached maturity. The yield of seed from 25 square feet was only 3.8 oz., equivalent to 446 lbs. per acre, but this compares favourably with that obtained by native cultivators in India.—[Wa.]

35/1. Nasturtium officinale R. Br. Howard, H. W., and Manton, I. (1940: *Nature*, cxlvi, 303) show that wild tetraploid watercress is not an auto- but an allo-polyploid and submit that it be treated as a new species.—[H.]

54. Brassica. Thomas, P. T., and Crane, M. B. (1942: Genetic Classification of Brassica crops; *Nature*, cl, 431) show that cultivated kales may be classified genetically under the cabbage type (2n = 18) and the swede type (2n = 38).—[H.] Howard (1942) discusses self incompatibility in polyploid forms.—[H.]

54/2. Brassica campestris L. Ramanujam, S. (1940: *Nature*, cxlv, 552-3) describes an apetalous mutation in Turnip observed in India.—[H.]

54/16. Brassica juncea (L.) Coss. Stansfield (1940) deals with the occurrence of this plant in the "four-foot" on the L.M.S. Rly. in the Liverpool district and beyond, and in the Martin Mere district, S. Lancashire. The plant is described and the probability of its binding the " bed of the rail " into a solid matrix and so interfering with the resiliency of the " road " dealt with.—[Wa.]

68/1. ISATIS TINCTORIA L. Redgrove, H. S. (1942: *Gard. Chron.*, cxl, 84-85) considers woad native near Tewkesbury.—[Wa.]

80. RAPHANUS. Howard (1942) discusses self incompatibility in polyploid forms.—[H.]

85. RESEDA. Arber, A. (1942: Studies in Flower Structure; VII. On the Gynaeceum of Reseda, with a consideration of Paracarpy; *Ann. Bot.*, N.S., vi, 43-48) shows that the gynoecium in its system of pollen tube conveyance is typically angiospermous.—[H.]

88/1. VIOLA STAGNINA Kit. apud Schultes. Dallman, A. A. (1942: *N.W. Nat.*, xvii, 255-256) reports the discovery of this violet near Doncaster, v.-c. 63, S.W. Yorkshire. The high probability of the record for Thorne Waste, in the same county, having been correct is suggested.—[Wa.]

88/4. VIOLA RIVINIANA Rchb. The variation of this species is described by Valentine, D. H. (1941: *New Phytol.*, xl, 189-209), who finds it possible to separate two subspecies, which he names " subsp. *nemorosa* N.W. & M. emend. Valentine " and " subsp. *minor* (Murbeck) Valentine " respectively.—[Wi.]

88/20. VIOLA § MELANIUM. Harrold (1942) records the occurrence of *Viola agrestis* Jord., *V. Deseglisei* Jord., and *V. Lloydii* Jord. in a field which had been under grass since 1918 but was ploughed in 1940 and planted with potatoes. It is suggested that the seeds reached the land in the mud caked on the blades of the plough, and on the boots of the men who carried out the ploughing.—[Wa.]

88/[?31]×33. VIOLA LUTEA Huds. × TRICOLOR L. Fothergill, P. G. (1941: Studies in *Viola*; III. An account of the Inheritance of certain characters in the Progeny of Plants of a Wild Population of *Viola* hybrids; *New Phyt.*, xl, 139-151) discusses the progeny of a wild population of hybrids between this species and *V. tricolor*. Neither of the original parents was recovered among the progeny. The plants obtained by chance crossings tend to be intermediates or to resemble *V. lutea* to a greater extent: their chromosome number (2n) varies from 24 to 58 with a peak at 48 (the somatic number of *V. lutea*). There is no connexion between the chromosome number of any plant and the possession by it of any combinations of morphological characters. Hairiness of leaves, spathulate middle lobe of stipule, long and slender petaloid spur and dentate sepaline appendages are all produced by specific dominant genes. Other characters are controlled by several polymeric genes.—[H.]

13. CARYOPHYLLACEAE. "The Floral Morphology of the Caryophyllaceae" has been investigated by Thomson (1942: *Amer. J.B.*, xxix, 333-349) in 29 species of 10 genera: it is concluded that the petal is probably a modified stamen, and that the Alsineae are more reduced and anatomically more advanced than the Sileneae: relationship to the Primulaceae is upheld, but none directly with Geraniaceae, and only remotely to Polemoniaceae.—[Wi.]

96. SILENE. Marsden-Jones, E. M., and Turrill, W. B. (1940: *Kew Bull.*, xxv, 66-73) have continued their researches on *S. maritima* and *S. vulgaris* and gives an account of plants grown from seed collected at Fearnan, Loch Tay. Characters which showed segregation were concerned with habit, sex, calyx shape, anthocyanin in calyx, possibly anthocyanin blotch in petals, corona, petal colour, filament colour, stigma colour, and flowering. The presence of a gene (or genes) more or less preventing proper development of flowering stems is strongly suggested in two families derived from one stock plant.—[Wa.]

96/8. SILENE ACAULIS L. Muirhead, C. W. (1942: *Gard. Chron.*, cxii, 108) contributes a short note on the distribution in Scotland.—[Wa.]

98/8. LYCHNIS ALPINA L. Muirhead, C. W. (1940A: *N.W. Nat.*, xv, 69-70) records a white-flowered plant from its classic Cumberland station.—[Wa.]

142/1. ACER PSEUDO-PLATANUS L. Parkin, J. (1940B: Variation in the Cotyledons of the Sycamore; *N.W. Nat.*, xv, 261-262) records the occurrence of seedlings with apparently three or four instead of two cotyledons, due to the complete splitting of one or both cotyledons. Scott, L. I. (1941: Flowering Sycamore Shoots; *Naturalist*, 25-27) records the persistence on trees for several years of old inflorescence axes.—[Wa.]

155/16. TRIFOLIUM REPENS L. This species contains a series of genetic factors which produce sterility due to cytological incompatibility, the study of which is continued by Atwood, S. S. (1941: *Amer. J.B.*, xxviii, 551-557).—[Wi.]

176/14. VICIA LATHYROIDES L. This species has been found on a sandy spit in Virginia between two rivers emptying into Chesapeake Bay, and, in the herbarium, from Nantucket Island, Massachusetts: not previously known in N. America. A. B. Massey (1941: *Rhodora*, xliii, 207-208).—[Wi.]

186/1. DRYAS OCTOPETALA L. The root-habit is described by Holch *et al.* (1941).—[Wi.]

219/1. LYTHRUM SALICARIA L. Fisher, R. A., and Mather, K. (1940: Non-lethality of the Mid Factor in *Lythrum Salicaria*; *Nature*, cxlvi, 521) conclude from breeding experiments that the Mid style length factor is not lethal when homozygous, as had been previously suggested. The same authors (1942: Polyploid

Inheritance in *Lythrum Salicaria*; *Nature*, cl, 430) discuss polyploid inheritance in this species in the light of further experiments.—[H.]

220/1. Epilobium angustifolium L. For observations on pollination and insect visitors see Dallman (1941B).—[Wi.] The root-habit is described by Holch *et al.* (1941).—[Wi.]

237/1. Hydrocotyle vulgaris L. For observations on pollination and insect visitors see Dallman (1941B).—[Wi.]

239. Eryngium. Mathias, M. E., and Lincoln, C. (1941: *Amer. Midland Nat.*, xxv, 361-387) give a synopsis of the North American species. Sixty-four species and several varieties are given, including *E. maritimum* L., *E. campestre* L. and *E. planum* L.; all as introduced from Europe.—[Wa.]

277/2. Heracleum Sphondylium L. Majumdar, G. P. (1942: The Organisation of the Shoot of *Heracleum* in the Light of Development; *Ann. Bot.*, N.S., vi, 49-81) has made an intensive study of the anatomy and development.—[H.] He also (1940: *Proc. Leeds Phil. and Lit. Soc.*, *Sci. Sect.*, iii, 642-651) describes the development and structure of the protoxylem vessels.—[Wa.]

318/19. Aster Tripolium L. Clapham, A. R., Pearsall, W. H., and Richards, P. W. (1942: Biological Flora of the British Isles; *J. Ecol.*, xxx, 385-395) give a biological and ecological account.—[Wa.]

320/3. Erigeron canadensis L. Smith, L. (1942: *N.W. Nat.*, xvii, 257) records this plant from waste land near Bridge Terrace, Doncaster, v.-c. 63, S.W. Yorkshire, where it was introduced with sand used in sand-bags.—[Wa.]

365/1. Achillea Millefolium L. The root-habit is described by Holch *et al.* (1941).—[Wi.]

391/1. Carlina vulgaris L. Green, H. E. (1941: *N.W. Nat.*, xvi, 37-39) deals with the morphology of the fruit and its dispersal.—[Wa.]

393/1. Arctium Lappa L. The bristles which form a tuft (pappus) on the summit of each fruit are sharply pointed and their sides armed with numerous sharp spikes. It is suggested that these bristles, which break off, irritate the skin of any animal to which the burr has become attached, causing the creature to scratch at the burr and in so doing knock it to pieces and scatter the fruits.—Latter, O. H. (1941: A Factor in the Dispersal of Burdock (*Arctium Lappa* L.); *Nature*, cxlviii, 726).—[Wa.]

416/10. Crepis taraxacifolia Thuill. Dallman, A. A. (1941A: *N.W. Nat.*, xvi, 203-206) discusses the occurrence of this species in Cheshire and elsewhere in Britain.—[Wa.]

419. Hieracium. Pugsley, H. W. (1942: *J.B.*, lxxix, 177-183, 193-197), in connection with his preparation of a monograph of the British species, gives diagnoses of a number of new species and brief explanations of other new specific names.—[Wa.]

460. PRIMULA. Saunders, E. R. (1941: The significance of certain morphological variations of common occurrence in flowers of Primula; *New Phyt.*, xl, 64) describes numerous morphological departures from type occurring sporadically in flowers of *Primula* together with the anatomical adjustments accompanying them.—[H.] Mather, K., and de Winton, D. (1941: Adaptation and Counter-Adaptation of the Breeding System in Primula; *Ann. Bot.*, N.S., v, 297-311) arguing from the results of breeding experiments on *P. sinensis* put forward a hypothesis to explain the origin and significance of heterostyly in this and other species of *Primula*.—[H.]

467/2. ANAGALLIS ARVENSIS L. Dallman, A. A. (1940B: *N.W. Nat.*, xv, 167-168) records some observations on the pollination and enumerates several insect visitors.—[Wa.]

480/1. GENTIANA PNEUMONANTHE L. The occurrence in Sussex is dealt with, with some ecological notes, by Wood, F. C. (1942: *Gard. Chron.*, cxii, 107-108).—[Wa.]

513/1. CONVOLVULUS ARVENSIS L. Accidental injury to a finger in preparing roots for chemical and physiological study disclosed that they contained an anti-haemorrhagic substance which immediately stopped the bleeding, the bad cuts healing readily—Bakke, A. L., and Render, A. D. (1942: *Amer. J.B.*, xxix, 353-4).—[Wi.]

532/1. LINARIA VULGARIS Mill. The variation in the peloric flowers of a single plant occurring in New York is described and figured by Camp, W. H., and Gilly, C. (1941: *Torreya*, xli, 33-42, pls. 1-2).—[Wi.]

543/10. VERONICA ALPINA L. The root habit is described by Holch *et al.* (1941).—[Wi.]

545. EUPHRASIA. Callen, E. O. (1941) publishes some records for vice-counties 87, 89 and 104, and describes two new varieties; *E. confusa* Pugsl. var. *maciana* and *E. nemorosa* Löhr var. *imbricata*. Edees (1942A) gives an account of the species met with in North Staffordshire.—[Wa.]

552. UTRICULARIA. Thompson, J. W., jr. (1940: *Trans. Wisconsin Acad.*, xxxii, 85-89) gives a key to the species of *Utricularia* in Wisconsin, U.S.A. Eight species are recorded, including *U. intermedia* Hayne, common throughout the States; *U. minor* L., rare; and *U. vulgaris* L. var. *americana* Gray, the commonest species.—[Wa.]

566. SALVIA. Saunders, E. R. (1940: Further observations on the Morphology and Anatomy of the Flower in *Salvia*; *Ann. Bot.*, N.S., iv, 629-633) adduces evidence for the persistence of vascular bundles after morphological form (in this instance that of stamens) has been lost.—[H.]

577/5. STACHYS PALUSTRIS L. The root habit is described by Holch *et al.*—[Wi.]

588/5. PLANTAGO MARITIMA L. Earnshaw, F. (1942: Experimental Taxonomy; V, Cytological Studies in Sea Plantains allied to *Plantago maritima* L.; *New Phyt.*, xli, 151-164) finds that in this group of plantains the basic chromosome number is x = 6. The N. American, Greenlandic and North European populations are 2x; those inhabiting the European alpine region are of two kinds, 2x and 4x. Since the 2x and 4x populations lead an almost independent evolutionary existence it is suggested that taxonomically they should be regarded as separate *ecospecies* within one *coenospecies*.—[H.]

633/4. ULMUS PLOTII Druce. The present known distribution in Wiltshire is set out by Welch and Grose (1942: 76).—[Wi.]

649/1. FAGUS SYLVATICA L. Harley, J. L. (1940: *J. Ecol.*, xxviii, 107-117) describes the root system, in woodland soils, with special reference to mycorrhizal infection.—[Wa.]

650. SALIX. Wilkinson, J. (1941: *Proc. Swansea Sci. and Field Nat. Soc.*, ii, 133-141) describes the Salices of the Gower, Glamorgan, and gives an account of their ecology.—[Wa.]

650/3b. SALIX ALBA L. var. CAERULEA (Sm.) Koch. Var. *caerulea* may be distinguished from other *S. alba* vars. on the basis of satellite number; it is considered to be a variety not a hybrid (Wilkinson, J.; 1941: The Cytology of the Cricket Bat Willow (*Salix alba* var. *caerulea*); *Ann. Bot.*, N.S., v, 149-165).—[H.] All the forms of *S. alba* and *S. fragilis* investigated are allotetraploids (2n = 76).—[Wi.]

656/1. ELODEA CANADENSIS Michx. Smith, A. M. (1941: *Naturalist*, 125-127) describes the female flower with some remarks on pollination.—[Wa.]

91. ORCHIDACEAE. Downie, D. G. (1941: *Trans. Bot. Soc. Edin.*, xxxiii, 94-103) gives the results of some experimental work on the germination of seeds of some British Orchids, which show that some species germinate asymbiotically quite freely in water, some germinate freely or only sparsely in sugar solution, while others resisted all attempts to induce germination. From a few species the fungal symbionts were isolated and experiments carried out to determine the effect of these mycorrhizal fungi on the seeds of their respective host plants and on the seeds of other species of orchids.—[Wa.]

665/1. GOODYERA REPENS (L.) R. Br. Downie, D. G. (1940: *Trans. Bot. Soc. Edin.*, xxxiii. 36-51) describes some experiments on the germination and growth of this orchid which tend to support the view that endophytic fungi play a large, if not the whole, part in the germination of orchid seeds in the field.—[Wa.]

668/2. EPIPACTIS HELLEBORINE (L.) Cr. emend. Rend. & Br. A single specimen found in New Hampshire, U.S.A., has been recorded by Upham (1942: *Rhodora*, xliv, 456-7, as *E. latifolia* (L.) All.): "contrary to the usual coloration of the flowers as given in descriptions, these were nearly white instead of greenish and showed little madder-purple suffusion." The species has been reported from various localities in North America.—[Wi.]

669. Orchis. Stephenson (1942A) contributes a note on the Dactylorchids of Cardiganshire, v.-c. 46. He reports that there are now barely a dozen plants of *O. purpurella* in the original locality where twenty-five years ago about 600 specimens were seen. Most of the other orchids which grew there have gone. Five other localities for *O. purpurella* are given, as well as records for *O. latifolia* L. sec. Pugsley, *O. pardalina* Pugs., *O. ericetorum* (Lint.) E.S.M. and *O. praetermissa* Dr. Lloyd (1940B) gives some notes on the status and distribution of the orchids in Shropshire.—[Wa.]

711/1. Gagea lutea (L.) Ker-Gawl. For observations on pollination and insect visitors see Dallman (1941B).—[Wi.]

716/1. Paris quadrifolia L. Shown by Darlington, C. D. (1941: Polyploidy, Crossing-over, and Heterochromatin in Paris; *Ann. Bot.*, N.S., v, 203-216) to have no alloeycly and, although tetraploid, to form no quadrivalents at meiosis and to have only one nucleolar organizer in its haploid sets.—[H.]

718. Juncus L. Richards, P. W., and Clapham, A. R. (1941: Biological Flora of the British Isles; *J. Ecol.*, xxix, 362-391) give accounts of *J. inflexus* L., *J. effusus* L., *J. conglomeratus* L., and *J. subnodulosus* Schrank.—[Wa.]

718/9 and 10. Juncus acutiflorus Ehrh. and J. articulatus L. Timm, E. W., and Clapham, A. R. (1940: Jointed Rushes of the Oxford District; *New Phyt.*, xxxix, 1-16) describe the morphology and cytology of both species and of the sterile hybrid, which is very common near Oxford. 2n: *J. acutiflorus* = 40; *J. articulatus* = 80; *J. acutiflorus* × *articulatus* = 60. A plant referred to as " large 80 " resembles both species in various ways; its taxonomic status awaits further investigation.—[H.]

721. Typha. Abnormalities in both *T. angustifolia* and *T. latifolia*, in which two or more spikes are juxtaposed (side by side), were found to be due to disturbances in the growing tissues caused by the larvae of the moth *Limnoecia phragmitella* Stainton: although " found wherever *Typha* is found," it always chooses *T. angustifolia* in preference to *T. latifolia* for laying its eggs (St John, H., 1941: " Teratologic Typha "; in *Rhodora*, xliii, 85-91).—[Wi.]

727. Lemna. See White, H. L. (1940: The Interaction of Factors in the Growth of *Lemna*; XV, On a Rhythmic Growth Cycle of *Lemna* Colonies associated with Transference to a Potassium free Nutrient Solution; *Ann. Bot.*, N.S., iv, 495-504).

735/1. Triglochin maritimum L. Recorded by Burke, F. (1942: *Nature*, cl, 405) from an inland locality (a salt spring at Aldersey, Cheshire).—[H.]

736/1. SCHEUCHZERIA PALUSTRIS L. Lloyd (1940A) gives the history of the occurrence in each of its four stations in Shropshire.—[Wa.]

740. ZOSTERA L. Tutin, T. G. (1942: Biological Flora of the British Isles; *J. Ecol.*; xxx, 217-226) gives detailed biological and ecological accounts of the British species.—[Wa.]

105. CYPERACEAE. A morphological study of the flowers has been made by Blaser, H. W. (1941: *Amer. J.B.*, xxviii, 542-551, 832-838). The bristles occurring in some genera are regarded as the veins of three sepals, extra bristles representing lateral veins of ancestral foliose sepals. Stamens may be two alternating whorls of three, and when only three occur it is usually the inner whorl that is lost, and the second whorl cannot be regarded as representing the inner whorl of stamens. Any second perianth whorl is trimerous, alternating with the sepals: if they are staminodal, they must represent a third outermost whorl of stamens. The gynoecium in most genera consists of three carpels.—[Wi.]

750/1. CLADIUM MARISCUS (L.) R. Br. Conway, V. M. (1940: Growth Rates and Water Loss in *Cladium Mariscus* R. Br.; *Ann. Bot.*, N.S., iv, 151-164) shows that the vascular supply to the leaves is insufficient to allow of vigorous transpiration and simultaneous cell extension. The plant is therefore an obligate helophyte.—[H.] Conway, V. M. (1942: Biological Flora of the British Isles; *J. Ecol.*, xxx, 211-216) gives a detailed biological and ecological account.—[Wa.]

753. CAREX. Several British species are mentioned by Fernald (1942: *Rhodora*, xliv, 281-331) in an article entitled "Critical Notes on Carex." *C. disticha* Huds. (as opposed to *C. Sartwelli* Dewey) does occur, possibly as an adventive, in Ontario. *C. caryophyllea* Latour. is accepted (pp. 286-8) as a valid name antedating *C. verna* Chaix in Vill. *C. aquatilis* Wahl. apparently gives trouble (pp. 295-8) by its variation in America as in Britain. *C. Bigelowii* Torr. is accepted as the correct name for the species so well known as *C. rigida* Good. (non Schrank), but the British (and European) plant is said (p. 299) to differ slightly from that of the type locality (in the White Mountains of New Hampshire, U.S.A.). *C. acuta* L. is considered (pp. 301-2) to be correctly used for *C. gracilis* Curt. The American representatives of *C. lasiocarpa* Ehrh. (pp. 304-5) and *C. pallescens* L. (pp. 306-7) are treated as varieties distinct from the European. The occurrence of typical *C. Hostiana* in Miquelon, the previous records all referring to the American var. *laurentiana*, is recorded (p. 319). The variation of *C. rostrata* Stokes in With. (under the wrongly applied name of *C. inflata* Huds.) is dealt with at some length (pp. 324-331). The article is illustrated by several good photographic plates.—[Wi.]

753/17. CAREX DISTANS L. f. Recently added to Flora of Mexico (from a valley at 4000 ft. above sea)—O'Neill (1942: *Rhodora*, xliv, 88). —[Wi.]

753/63×57. CAREX BOENNINGHAUSENIANA Weihe. Whellan, J. A. (1942B: *Carex Boenninghauseniana* Weihe in West Lancashire; *N.W. Nat.*, xvii, 254-255) reports that E. Nelmes so names a sedge from near Brock, West Lancashire. It is apparently the sedge previously recorded in the supplement to Wheldon & Wilson's *Flora of West Lancs.* from this locality as *C. axillaris* Good, which should therefore be deleted from that Flora.—[Wa.] The " 60 " under ×*C. axillaris* in the *Comital Flora* (p. 340) should be transferred to ×*C. Boenninghauseniana* (p. 341).—[Wi.]

106. POACEAE. Dore, W. G., and Roland, A. E. (1942: *Proc. Nova Scotia Inst. Sci.*, xx, 177-288) give a systematic account of " The Grasses of Nova Scotia " with keys, notes on characteristics, nomenclature and distribution. 121 species are recorded for the province, many of which are also British and occur in Nova Scotia either as native or as introduced plants.—[Wa.]

765/11. PHALARIS ARUNDINACEA L. The rhizome system is described by Mueller (1941).—[Wi.]

824/2. POA PRATENSIS L. Brown, W. C. (1939: *Amer. J. Bot.*, xxvi, 717-723) discusses the chromosome complement of five species of Poa and gives an analysis of variation in *P. pratensis*. He also deals with the cytogenetics of that species (1941: *Ann. Miss. Bot. Gard.*, xxviii, 493-516). Akerberg, E. (1939: *Hereditas*, xxv, 359-370) deals with apomictic and sexual seed formation.—[Wa.] The rhizome system is described by Mueller (1941).—[Wi.] Variation in size and appearance of the spikelets in the same panicle (in Nova Scotia) was caused by an infection of a nematode worm: the infected spikelets were larger and greener, though fewer and, in heavily-infected plants, forming a much reduced panicle. *Poa costata* Schumacher may be only such a diseased state.—Dore, W. G., 1942: in *Rhodora*, xliv, 246-7.—[Wi.]

835. HORDEUM. Chin, T. C. (1941: The Cytology of some Wild Species of *Hordeum*; *Ann. Bot.*, N.S., v, 535-545), found in California material of *H. nodosum* L. from different altitudes, two diploid forms (2n = 14) and one tetraploid (4n = 28). Two distinct forms of *H. murinum* L. are described, one from Cambridge and the other from the United States of America, both of which are tetraploids (4n = 28).—[Wi.]

844/2. EQUISETUM ARVENSE L. An account of the finding of large numbers of gametophytes in Connecticut on alternately wet and sun-baked fine soil at the base of a disused pit, is given by

Matyke (1941: *Torreya,* xli, 181-186); it was not uncommon for one gametophyte to bear more than one sporophyte.—[Wi.]

844/8. EQUISETUM TRACHYODON Braun. Matthews, J. R. (1940: *Equisetum trachyodon* as a Scottish Plant; *Trans. Bot. Soc. Edin.*, xxxiii, 29-32) reviews its history as a British plant with special reference to its occurrence on the banks of the R. Dee, Banchory, Kincardineshire. H. C. Watson rejected the record as dubious, but there is a specimen in the Aberdeen University Herbarium labelled " banks of the River Dee at Banchory " dated 16th August 1842. No collector's name is given, but as 1842 was the year in which the Rev. J. B. Brichan published an account of the occurrence of this along with *E. hyemale* and *E. variegatum* in the parish of Banchory it is probable that he was the collector. Specimens from the locality also exist in Herb. Mus. Brit. and Herb. Kew. The plant still grows on the banks of the Dee, near the Bridge of Potarch, Aberdeenshire. It appears to have disappeared from the Banchory locality, but the Kincardineshire (v.-c. 91) record should stand in view of Brichan's original gatherings.—[Wa.]

847/1. PTERIDIUM AQUILINUM (L.) Kuhn. The morphology of the rhizome, with special reference to soil conditions and the phenomena of invasion as observed in Breckland, is described by Watt, A. S. (1940: Contributions to the Ecology of Bracken (*Pteridium aquilinum*); I, The Rhizome; *New Phyt.*, xxxix, 401-422). —[H.]

864/1. OSMUNDA REGALIS L. Payne, L. G. (1942: *London Naturalist*, 1941, 12-13) reports two recent records in West Surrey.—[Wa.]

868/1. AZOLLA FILICULOIDES Lam. Dallman and Williams (1940) and Williams, E. G. (1940 and 1941: Further Notes on *Azolla filiculoides* Lam.; *N.W. Nat.*, xv, 265-266 and xvi, 208) discuss this species with special reference to its occurrence in a pond on the Curzon Park Golf Links and in a pond near Bidston Junction Station, Wirral, Cheshire.—[Wa.]

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THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

VOL. XII. PART VI.

REPORT FOR 1943-44

(WITH BALANCE SHEETS FOR 1943 AND 1944)

BY

THE HONORARY EDITOR,

A. J. WILMOTT,

Natural History Museum, Cromwell Road, London, S.W. 7

(in the absence of F. C. Wallace on Active Service.)

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MATERIAL FOR THE NEXT REPORT.

Material for the next Report—Records, Notes, etc.—should be sent to Mr A. J. Wilmott, as Mr E. C. Wallace is still with H.M. Forces (R.A.F.).

SPECIMENS FOR IDENTIFICATION.

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BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

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Members of the Society will welcome the return of Mr John F. G. Chapple from service with the Armed Forces, and are asked to note that he has now resumed his office as Hon. Secretary and that general correspondence should be addressed to him at Yardley Lodge, Crick Road, Oxford. This includes replies to the questionnaire, and correspondence relating to membership and to the sale of publications.

At the Annual General Meeting on Wednesday, the 27th March, a cordial vote of thanks to Mr A. J. Wilmott was passed. Members will appreciate that Mr Wilmott, in his capacity as Hon. Acting Secretary, has helped the Society through a difficult period, and that the present flourishing state of its affairs is largely due to his efforts. Mr Wilmott will continue as Hon. Editor, with Mr Wallace, who has not yet been released from the forces, and as Hon. Secretary for meetings. Correspondence relating to the Report and to matters to be brought up at the Committee should be addressed to Mr Wilmott. Mr Wilmott will be pleased to continue to name specimens.

H. T. BAKER, *Chairman.*

8th April 1946.

THE BOTANICAL SOCIETY AND EXCHANGE CLUB OF THE BRITISH ISLES.

(VOL. XII. PART VI).

Victoria Regina.

Floreat flora.

REPORT FOR 1943-44

BY

THE HONORARY EDITOR,
A. J. WILMOTT,
Natural History Museum, Cromwell Road, - London, S.W.7;
(in the absence of E. C. Wallace on Active Service).

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Cross, Hon. Marjorie, Ash House, Broughton-in-Furness.
†Cruttwell, Rev. N. E. G., The Rectory, Basingstoke, Hants.

Daly, Mrs Bowes, Drumlanrig Castle, Thornhill, Dumfries-shire.
†Dandy, J. E., M.A., F.L.S., British Museum (Natural History), The Zoological Museum, Tring, Herts.
Darlington and Teesdale Naturalists' Field Club, J. B. Nicholson, Secretary, 16 Welbeck Ave., Darlington.
David, Miss Aileen M., Hillside, Llandaff, Cardiff.
†Davie, Dr J. H., Clifton College at Westcliff, Bude, Cornwall.
Davies, Mrs H. R., 147 Coleherne Court, Redcliffe Gardens, S.W.5.
Davy, Lady, Green End, Keyhaven, Lymington, Hants.
Day, Miss E., 32a St Peter Street, Sandwich, Kent.
†Day, Francis M., The Downs School, Colwall, Malvern.
Dent, G., Speedwell, Wych Cross, Forest Row, Sussex.
Dent, Mrs R. W., O.B.E., Flass, Maulds Meaburn, Penrith.
Devonshire, The Duke of, Chatsworth, Buxton, Derbyshire.
†Dony, John G., B.Sc., Ph.D., 41 Somerset Ave., Luton, Beds.
Dufferin, Brenda, Marchioness of, Sheldon Manor, Chippenham, Wilts.
L Duncan, Miss Ursula, Parkhill, Arbroath, Angus.
*Dunston, Capt. Ambrose E. A., Burltons, Donhead St Mary, Wilts. (via Shaftesbury, Dorset).
Durham University, (Miss K. M. Chalklin, M.Sc.) Dept. of Botany, University Science Laboratories, South Road, Durham.

*†Edees, E. S., M.A., 19 Dartmouth Avenue, Westlands, Newcastle, Staffs.
Eire, National Museum, The Acting Director, Kildare Street, Dublin, Eire.
Eire, Controller, Stationery Office (Publications Branch), Dublin.
Eliot, Lady Alethea, Newtimber Place, Hassocks, Sussex.
Ellis, A. E., M.A., F.L.S., Epsom College, Surrey.
Ellis, E. A., Castle Museum, Norwich.
Ellis, Edgar W., Gedham, Ossett, Yorks.
Evetts, Mrs E. F., J.P., Wood House, Tackley, Oxon.
Eyre, Mrs R. S. K., Woodside, Crowborough, Sussex.

Fanshawe, D. B., Mazaruni Station, British Guiana.
Findeisen, K. D., Yonder Fowdon, Churston Ferrers, South Devon.
*Fleming, Dr G. W. T. H., F.L.S., Barnwood House, Gloucester.
Foggitt, Mrs G., 22 Haslemere Road, Sketty, Swansea.
Foster, M., Leconfield House, College Road, Cheltenham.
Frankland, J. N., 59 Otley Road, Shipton, Yorks.
Frost, Miss L. Winifred, 98 Bolton Road, Salford 6, Lancs.
Frowde, Miss Dora M., Elmsleigh, Colerne, Chippenham, Wilts.

German, Mrs P., Newlands, The Plantation, Durrington, Worthing, Sussex.
†Gilmour, J. S. L., M.A., F.L.S., Royal Botanic Gardens, Kew, Surrey.

Gladstone, Viscountess, 27 Chester Terrace, S.W.1.
Glyn, Hon. Mrs Maurice, 28 Albert Hall Mansions, S.W.7.
Goddard, H. J., The Knap, Skew Bridge, Wilton Road, Salisbury, Wilts.
L Gordon, Seton, C.B.E., Upper Duntuilm, Isle of Skye.
Gough, Mrs H., Raford, Athenry, Co. Galway, Eire.
†Gough, J. W., M.A., 43 Sandfield Road, Headington, Oxford.
Graddon, W. G., The Brooms, Park Lane, Congleton, Cheshire.
Graham, Mrs E., 9 Ralston Street, Tedworth Square, S.W.3.
Graham, Rex, 7 Park Close, Dollis Hill Ave., Cricklewood, N.W.2.
Graham, Commander R. D., Stawell House, near Bridgewater, Somerset.
Graham, Prof. R. J. D., M.A., D.Sc., F.R.S.E., Dept. of Botany, The University, St Andrews.
Graveson, A. W., M.A., Tintagel, Stoke Road, Beaminster, Dorset.
Gray, Henry Yewtree, West Malling, Kent.
Gray Herbarium, The, Harvard University, Cambridge, Mass, U.S.A.
Green, Capt. P. S., Louches, Naphill, High Wycombe, Bucks.
Green, T. H., Sabinal, Weston, Bath.
Gregor, Rev. A. G., M.A., B.D., Firle Vicarage, near Lewes, Sussex.
*†Grose, J. D., 18 Regent Street, Swindon, Wilts.
Gurney, John, Walsingham Abbey, Norfolk.

†Haines, John W., Midhurst, Green Lane, Hucclecote, Gloucester.
Haines, Mrs J. W., Midhurst, Green Lane, Hucclecote, Gloucester.
Hall, Fredk. T., 2 Hartington Terrace, West Road, Buxton, Derbyshire.
†Hall, R. H., 2 Hartington Terrace, West Road, Buxton, Derbyshire.
Hardaker, W. H., 451 City Road, Edgbaston, Birmingham 17.
Hardinge, Hon. Lady, St James's Palace, London, S.W.1.
Hare, Dr C. Leighton, The Jodrell Laboratory, Royal Botanic Gardens, Kew, Surrey.
Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., King's College, Newcastle-upon-Tyne.
*Harrison-Church, Mrs D. V., B.Sc., Bedford College for Women, Regent's Park, N.W.1.
Hartley, J. W., Irene, Marple Road, Stockport.
Harvey, Rev. H. H., Clawton Vicarage, Holsworthy, Devon.
Harvey, F./O. J. W., Foxbrake, Higher Bebington Rd., Bebington, Wirral, Cheshire.
Hassall, Mrs B., The Manor House, Wheatley, Oxford.
Haughton, Dr J. W., Tawnachie, Wood Lane, Falmouth.
Haynes, Gerald, 8 Canterbury Road, Oxford.
*Hayward, Miss Ida M., F.L.S., 7 Abbotsford Road, Galashiels, Selkirkshire.
Heron, Miss May, Erclands, Ercall Lane, Wellington, Salop.
Hichens, Mrs, c/o Mrs Hingston, Windward House, Tavistock, Devon.
Hill, S. Ashton, Carnaby, 19 Jordan Road, Four Oaks, Warwickshire.
Horticultural Society, The Royal, Vincent Square, Westminster, S.W.1.
*†Howarth, W. O., D.Sc., F.L.S., Botany Dept., The University, Manchester 13.
Hull, University College, The Librarian, Hull.
Hurst, C. P., F.L.S., Landulph Rectory, Saltash, Cornwall.
Hutchinson, R. R., 11 Fryston Avenue, Croydon, Surrey.

Innes, Rev. M. B., Downside Abbey, Nr. Bath, Somerset.

Jack, James, Luggiebank, Cumbernauld Station, Glasgow.
†Jackson, A. Bruce, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
Jekyll, Francis, Munstead Wood, Heath Lane, Godalming, Surrey.
Jowett, Miss Edith B., Oreton Mount, Grange-over-Sands, Lancs.

Kennedy, Mrs C. Moore, c/o Westminster Bank Ltd., Bromley, Kent.
†Kent, D. H., 75 Adelaide Road, West Ealing, London, W.13.
Kew, H. Wallis, Penmoil, Cock Lane, High Wycombe, Bucks.
Kirby, Mrs G. E., Sankey House, Brook, near Ashford, Kent.

Lambert, Miss Joyce M., Botany Dept., Westfield College, at St Peter's Hall, Oxford.
Lawn, Dr J. G., 6 Lothbury, London, E.C.2.
Leadbitter, E. C. E., C.V.O., 160 Addiscombe Road, Croydon.
Leake, Miss P., 17 Westmorland Road, Bromley, Kent.
Leather, Miss Vivien M., c/o Mrs C. Berens, Heath Hill, Ewshott, Farnham, Surrey.
Lee, John R., 96 Finlay Drive, Dennistoun, Glasgow, E.1.
Leeds Central Library, The City Librarian, Central Library, Leeds 1.
Legard, Lady Edith, Maes Court, Tenbury, Worcester.
Leicester Museum and Art Gallery, Leicester.
L Lewis, J. Spedan, Leckford Abbas, Stockbridge, Hants.
†Lewis, R., "Fidler's Elbow," Staunton Road, Monmouth.

†Libbey, R. P., Prospect Cottage, Eldwick, Bingley, Yorks.
Linnean Society of London, The, Burlington House, Picadilly, W.1.
Little, Miss K. D., 19 The Avenue, Hitchin, Herts.
London Natural History Society (Botanical Section), G. R. A. Short (Secretary), 36 Parkside Drive, Edgware. Middlesex.
Long, Miss D. A. C., Wistaria Cottage, Broadway, Worcs.
Long, Jas. W., Hillside, St John's Road, Newport, Isle of Wight.
L†Longfield, Miss C. E., 20 Pont Street, London, S.W.1.
†Lousley, J. E., 7 Penistone Road, Streatham Common, S.W.16.
Lucas, Baroness, 22 Sussex Square, Hyde Park, W.2.

L†McClintock, Lt.-Col. D., Park Grove, Withyham, Tunbridge Wells, Sussex.
†Mackechnie, Robert, B.Sc., 9 Skirving Street, Shawlands, Glasgow, S.1.
Mackenzie, Major Roderick, Fawley Court, Henley-on-Thames.
McLean, Prof. R. C., University College, Newport Road, Cardiff.
L MacLeay, Kenneth N. G., Botany Dept., St Andrews University.
McLeod, Sir Murdoch, Bart., Culverlea House, Pennington, Lymington, Hants.
Makins, F. K., F.L.S., Great Down Cottage, Bruton, Somerset.
Manchester Museum, The, The University, Manchester 13
Marks, C. E., Islington Cemetery, East Finchley, N.2.
Marsden-Jones, E., F.L.S., Close Cottage, Littleton Panell, Devizes, Wilts.
Marsh, Miss F. H. B., J.P., F.L.S., Thornleigh, Mordiford, Hereford.
Martin, Rev. W. Keble, M.A., F.L.S., The Vicarage, Torrington, Devon.
Matthews, Prof. J. R., Botany Department, The University, Old Aberdeen.
Mayne, W. Erskine, Ltd., 25 Queen's Arcade, Belfast.
Megaw, Rev. W. R., B.A., M.R.I.A., 376 Ormeau Road, Belfast, N. Ireland.
†Melville, R., B.Sc., Ph.D., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Mills, J. N., 47 Banbury Road, Oxford.
Mills, Dr W. H., 23 Storey's Way, Cambridge.
Milne, James Fairweather, M.A., M.B., Ch.B., Rocksley House, Boddam, Peterhead, Aberdeenshire.
†Milne-Redhead, E., M.A., F.L.S., Royal Botanic Gardens, Kew, Surrey.
Milvain, Mrs M., Green Close, Snowshill, near Broadway, Worcs.
Montgomery, Mrs R., c/o Stobo, Lower Bourne, Farnham, Surrey.
Moon, John McK., "Finglush," Station Road, Greenisland, Co. Antrim, N. Ireland.
†Morgan, Miss Beryl M. C.. Braeside, Horley, Surrey.
Morgan, Miss M. C., Lowood, Bourne End, Bucks.
Morley, Earl of, Saltram, Plympton, Plymouth, Devon.
Moss, Rev. W. H. O., R.N., Monkton Wyld Rectory, Charmouth, Dorset.

†Nelmes, E., Royal Botanic Gardens, Kew, Surrey.
Nelson, George A., Ph.C., F.L.S., 37 The Crescent, Adel, Leeds 6.
New York Botanical Garden (W. J. Robbins, Director), Bronx Park, New York, N.Y., U.S.A

Northamptonshire Natural History Society, c/o H. G. Allen, B.Sc. (Hon. Sec., Bot. Sec.), Ivydale, Wootton, Northampton.
Norton, F., " Westward Ho," 3 Pencisely Rise, Cardiff.
*Nottingham Public Natural History Museum, Wollaton Hall, Nottingham.

Oslo, The Botanical Museum of the University of, c/o Royal Norwegian Ministry of Education, Kingston House, Princes Gate, London, S.W.7.
Oxford University, Dept. of Botany, The Librarian, Oxford.
Oxford University, Dept. of Forestry, The Librarian, Oxford.

Paget, Lady, Achnashellach, Ross-shire.
--†Palmer, The Hon. W. J. L., The Old House, Wonston, Sutton Scotney, Hants.
Park, K. J. F., Rydol Cottage, Station Road, Allendale, Northumberland.
Parkin, J., M.A., F.L.S., Blaithwaite, Wigton, Cumberland.
Partridge, Mrs Frances, Ham Spray House, near Marlborough, Wilts.
Patton, Dr Donald, M.A., B.Sc., Ph.D., F.R.S.E., 15 Jordanhill Drive, Glasgow, W.3.
Penson, J. H., 11 Well Walk, Hampstead, N.W.3.
Pharmacie, Bibliotheque de la Faculté de, 4 Avenue de la Observatoire, Paris, France.
Phelp, S., 43a Quinton Street, Earlsfield, S.W.18.
Phelps, Mrs J. V., Woodbury, East Avenue, Bournemouth, Hants.
†Phillips, Edwin Masson, 26 Cheltenham Place, Plymouth, Devon.
Pickard, Miss Kathleen, Harveys, Glynde, Lewes, Sussex.
Pigott, C. D., Clevedon, Harestone Hill, Caterham, Surrey.
L Polunin, Nicholas, M.S. (Yale), M.A., D.Phil., D.Sc. (Oxon.), The Herbarium, Botanic Garden, Oxford.
Pope, C. N., 256 Hythe Road, Ashford, Kent.
†Pownall, Rev. G. C., Glenroy, Windmill Road, Minchinhampton, Glos.
†Price, W. R., Cockleford Mill, Cowley, near Cheltenham.
Priestley, Prof. J. H., B.Sc., D.S.O., Dept. of Botany, The University, Leeds.
Prime, C. T., M.A., F.L.S., 147 Upper Selsdon Road, Croydon, Surrey.
†Pugsley, H. W., B.A., 81 Alexandra Road, Wimbledon, S.W.19.

Ramsbottom, J., O.B.E., M.A., Dr.Sc., P.P.L.S., Keeper, Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
†Raven, John E., The Master's Lodge, Christ's College, Cambridge.
†Rawlins, Miss E., Oakfield, Winscombe, Somerset.
Rea, Carleton, B.C.L., M.A., 6 Barbourne Terrace, Worcester.
Rees, Mrs F. L., 5 Hill Park, Tenby, Pembrokeshire.
Rees, John, B.A., M.Sc. (Adviser in Agricultural Botany), University College (S.W. & M.), Cathays Park, Cardiff.
L Richards, Mrs H. M., Caerynwch, Dolgelley, N. Wales.
Richards, Dr P. W., The Botany School, Cambridge.
Ridley, H. N., C.M.G., F.R.S., 7 Cumberland Road, Kew Gardens, Surrey.
Ridley, Hon. Mrs J., Mockbeggars Hall, Claydon, Suffolk.
*Rilstone, F., A.L.S., Lambourne Hill, Penhallow, Truro, Cornwall.
*Rob, Miss C. M., Catton Hall, Thirsk, Yorks.
Roberts, G. A., 53 Broadway, Fulford, Yorks.
Roche, The Lady, Cadlington, Oxford.
*Rose, Mrs Eric, Leweston Manor, Sherborne, Dorset.
†Rose, Francis, B.Sc., Boxtree House, East Malling, Kent.
Russell, Lady Victoria, The Ridgeway, Shere, Guildford, Surrey.

Salisbury, Prof. E. J., C.B.E. D.Sc., F.R.S., F.L.S., Willow Pool, 4 Gills Hill Lane, Radlett, Herts.
Salmon, Miss Hilda M., Harwood, Horsham, Sussex.
Sandwith, Mrs Cecil, 26 Canynge Square, Clifton, Bristol, 8.
†Sandwith, N. Y., M.A., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

Saunders, E. Arthur, M.A., M.B., F.R.C.P., The Lawn, Barcombe Mills, Nr. Lewes, Sussex.
Saunders, Miss E. F., Ortler, Bouncers Lane, Prestbury, Cheltenham, Glos.
Severn, Lady, Winterbrook Lodge, Wallingford, Berks.
Seward, Mrs O. G., Weston House, near Petersfield, Hants.
Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex.
Simpson, N. Douglas, M.A., F.L.S., F.R.M.S., Maesbury, 3 Cavendish Road, Bournemouth, Hants.
Skene, Prof. Macgregor, D.Sc., University, Bristol, 8.
†Sladen, W. J. L., 28 Grove Way, Esher, Surrey.
*†Sledge, Dr W. A., 9 St Chad's Drive, Headingley, Leeds, 6.
Small, Prof. J., D.Sc., Dept. of Botany, Queen's University, Belfast, N.I.
Smith, Dr H. B. Willoughby, M.B., F.R.C.S., St Clements, 9 Carson Road, Gainsborough, Lincs.
Smith, R. L., 24 Grand Avenue, Ely, Cardiff, Glam.
Smith, Prof. Sir Wm. Wright, D.Sc., Royal Botanic Garden, Edinburgh, 4.
L Southall, A. W., Clifford's Mesne, Newent, Glos.
South London Botanical Institute, 323 Norwood Road, London, S.E.24.
Sowter, F. A., Ashtead, 9 North Avenue, Leicester.
Stationery Office, H.M., Princes Street, Westminster, S.W.1.
Stephenson, Rev. Dr T., D.D., The Museum, Torquay, Devon.
Stern, Colonel F. C., O.B.E., M.C., Highdown, Goring-by-Sea, Sussex.
Stevenson, Miss E. H., 28 Foxcombe Road, Weston, Bath, Somerset.
Stewart, Mrs M. E., Partney, Spilsby, Lincs.
Stuart, Mrs C. U., 120 London Road, Worcester.
Stuart-Edwards, J. J., Imperial Hotel, Exmouth, S. Devon.
Swaine, Miss A. K., Pisang Cottage, Nailsea, Somerset.
†Swann, Eric L., 282 Wootton Road, King's Lynn.

L†Taylor, Dr G., British Museum (Natural History), Cromwell Road, London, S.W.7.
Taylor, Miss M., 6 Kent Gardens, Ealing, W.13.
Taylor, S. A., 34 Nelson Street, Leicester.
Temperley, Geo. W., Restharrow, Apperley Road, Stocksfield, Northumberland.
Templeman, A., Geological Museum, Exhibition Road, South Kensington, S.W.7.
†Thomas, Charles, Arden, 48 Manor Road North, Edgbaston, Birmingham, 16.
†Thomas, Miss E. Mary, Moorfield, Nottage, Porthcawl, Glam.
Thorold, C. A., Hele, Bradninch, Devon.
Tindall, Mrs K. B., West Downs, Winchester, Hants.
†Todd, Miss E. S., Aldbourne, Marlborough, Wilts.
Toke, Chas. Hugh, The Haven, Green Lane, Crowborough, Sussex.
Townsend, C. C., Tolgarrick House, Tuckingmill, Camborne, Cornwall.
†Travis, W. G., 9 Barton Road, Liverpool, 9.
Trethewy, A. W., Artillery Mansions, Victoria Street, S.W.1.
Tristram, Mrs R. M., F.L.S., Revillo, Ash Bank, Stoke-on-Trent, Staffs.
Tunbridge Wells Municipal Museum, 6 Upper Grosvenor Road, Tunbridge Wells, Kent.
Turnbull, Miss E., Stone Lodge, Vines Lane, Hildenborough, Kent.
Turner, A., 140 Pine Street, Nelson, Lancs.
†Turrill, W. B., D.Sc., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

Ullman, Lt.-Col. R. B., Trove, New Road, Esher, Surrey.

†Vachell, Miss Eleanor, F.L.S., Fairfield, Ely Road, Llandaff, Cardiff.
Valentine, D. H., M.A., Ph.D., Botany School, Cambridge.
†Verdcourt, B., 86 Claremont Road, Luton, Beds.

Victoria, The Public Library of, Melbourne, c/o Henry Sotheran Ltd., 2 Sackville Street, Piccadilly, W.1.
Vivian, Miss C., 37 Wilton Crescent, London, S.W.1.

†Wade, A. E., F.L.S.. Dept. of Botany, National Museum of Wales, Cardiff.
Waldy, Hon. Mrs H. P., Sonamerg, Higher Sea Lane, Charmouth, Dorset.
*†Wales, National Museum of, Dept. of Botany (Keeper, H. A. Hyde, M.A.), Cardiff.
*†Wallace, E. C., 2 Strathearn Road, Sutton, Surrey.
†Walters, S. M., Webb's Land, Wickham, Fareham, Hants.
Warner, S. Allen, M.P.S., Whitelea, Broadway, Didcot, Berks.
L Warren, W. E., Selborne, Horsell Rise, Horsell, Woking, Surrey.
Washington, U.S. Dept. of Agriculture, The Librarian, Washington, D.C., U.S.A.
Watchorn, Dr Elsie, 25 Luard Road, Cambridge.
†Watson, Wm., 245 Southlands Road, Bickley, Bromley, Kent.
Watts, Lt.-Col. G. A. R., Highbury, Victoria Road, Fleet, Hants.
Webster, Subaltern M. McCallum, A.T.S., c/o Bank of Scotland, Macduff.
L Wedgwood, Mrs, 2 Hatherley Road. Kew Gardens, Surrey.
Wedgwood Herbarium, The, Marlborough College, Wilts.
Welch, Mrs B., B.Sc., 49 Lichfield Court, Richmond, Surrey.
Wells, Mrs E. M., 91 Colum Road, Cardiff.
†West, C., "The Cowl House," Holt Wood, Aylesford, Kent.
Weyer, Major B. G. Van de, South Marston Manor, Swindon, Wilts.
Weyer, Major William Van de, Clyffe, Dorchester, Dorset.
†Whellan, J. A., Lieut., 42 Stamford Street, Liverpool 7.
Whiting, Miss M. M., Rosemary Cottage, Blythburgh, Suffolk.
Whyte, James S., 31 Hayswell Road, Arbroath, Angus.
Wilkinson, J. S., 26 Golder's Rise, Hendon, N.W.14.
Willan, Mrs Hugh, Bridges, Teffont, Salisbury.
Williams, E. G., M.A., F.R.I.C., 61 Earlsway, Curzon Park, Chester.
Williams, Mrs F. R., 234 Highland Avenue, Winchester, Mass., U.S.A.
Williams, John E. Miles, 28 Spencer Road, St Marks, Cheltenham.
Williams, I. A., West Hall, Kew Gardens, Surrey.
Williams, M. L., Layton Villa, Linden Road, Bognor, Sussex.
†Wilmott, A. J., M.A., F.L.S., F.R.G.S., Dept. of Botany, British Museum (Natural History), Cromwell Road, S.W.7.
Wilson, Albert, F.L.S.. Tir-y-Coed, Ro Wen, near Conway.
Winter, W. P., B.Sc., F.G.S., 6 Grange Avenue, Saltaire, Yorks.
Wolley-Dod, Lt.-Col. A. H., Berkeley Cottage, Mayfield, Sussex.
Woodhead, J. E., B.Sc., F.I.C., Ph.C., 325 Kennington Road, London, S.E.11.
L Wright, Dr F. R. Elliston, Braunton, N. Devon.

Yeoman, Miss Ruth, The Green, Brompton, Northallerton, Yorks.
York Public Library, City of, York.
Young, Rev. Andrew, Stonegate, Tunbridge Wells, Kent.
Young, Donald P., B.Sc., Ph.D., A.R.I.C., "Craigmore," 307 Burton Rd., Derby.
L Young, Miss Gertrude A., 5 Woodlands Terrace, Glasgow, C.3.
Yuill, Edward, Norwood, Towthorpe Lane, Haxby, York.

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Holland, J. S. (Westwell Manor, Burford, Oxon.), New Modderfontein Staff Mess, P.O. Van Ryn Benein, S. Africa.
Lindquist, Dr B., Skogshogskolan Experimentalfaltet, Stockholm, Sweden.
McCrea, Mrs M. A., 4 Springfield Terrace, King's Road, Guernsey.
Nannfeldt, Dr John Axel, Botaniska Institutionen, Uppsala, Sweden.

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,, Subscriptions received during the year	120 3 6	,, Fire Insurance on Books, etc., at Yardley Lodge ...		0 10 0
,, Sale of Reports and Reprints	18 19 7	,, Honorarium to Caretaker at Yardley Lodge ...		1 11 6
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		Treasurer ...	£5 0 0	
		Acting Secretary	2 13 6	
		Joint Editor	0 15 0	
		Caretaker at Yardley Lodge	3 0 0	
				11 8 6
		,, Purchase of back Reports		5 10 3
		,, Advertisement in Wild Flower Magazine, 1942-3		1 0 0
		,, Balance		486 7 6
	£515 3 2			£515 3 2

PUBLICATIONS FUND.

To Balance from 1942 ...	£164 14 6	By Balance	£187 9 6
,, Sales of Fl. Northants ...	3 0 0		
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	£187 9 6		£187 9 6

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	£16 7 11		£16 7 11

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	£41 3 6		£41 3 6

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	£	s.	d.		£	s.	d.
General Fund	£486	7	6	500 National Savings Certificates at cost	£400	0	0
Publications Fund	187	9	6	Cash at Bank	267	6	8
Life Members' Fund	163	8	11	Deposit at Post Office Savings Bank	227	10	8
Miss Trower's Fund	16	7	11				
Benevolent Fund	41	3	6				
	£894	17	4		£894	17	4

Examined and found correct.
22nd January 1944.

(Signed) J. E. LOUSLEY,
Hon. Treasurer.
(Signed) H. W. PUGSLEY,
Hon. Auditor.

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GENERAL FUND.

	£	s.	d.		£	s.	d.
To Balance from 1943	£486	7	6	By Printing of 1941-2 Report and Postage thereon	£138	5	9
,, Subscriptions received during the year	116	11	0	,, Printing (other than Report) and Stationery	7	8	3
,, Sale of Reports and Reprints	17	11	8	,, Fire Insurance on Books, etc., at Yardley Lodge	0	10	0
,, Interest on Deposit with P.O. Savings Bank for 1942-1943	11	10	0	,, Gratuities at Meetings	0	12	6
				,, Postages and Petty Expenses :— Treasurer ... £5 10 0 Acting Secretary ... 5 0 0	10	10	0
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				,, Balance	474	3	8
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PUBLICATIONS FUND.

	£	s.	d.		£	s.	d.
To Balance from 1943	£187	9	6	By Cost of Binding	£10	5	0
,, Sales of Fl. Northants	1	0	0	,, Balance	198	19	4
,, Donation	0	10	0				
,, Sales of Comital Flora and Plant List	20	4	10				
	£209	4	4		£209	4	4

LIFE MEMBERS' FUND.

	£	s.	d.		£	s.	d.
To Balance from 1943	£163	8	11	By Balance	£177	8	11
,, Subscriptions compounded during the year	14	0	0				
	£177	8	11		£177	8	11

MISS TROWER'S FUND.

	£	s	d		£	s	d
To Balance from 1943	£16	7	11	By Balance	£16	7	11
	£16	7	11		£16	7	11

BENEVOLENT FUND.

	£	s	d		£	s	d
To Balance from 1943	£41	3	6	By Balance	£41	3	6
	£41	3	6		£41	3	6

BALANCE SHEET as at 31st December 1944.

	£	s	d		£	s	d
General Fund	£474	3	8	500 National Savings Certificates at cost	£400	0	0
Publications Fund	198	19	4	Cash at Bank	269	2	8
Life Members' Fund	177	8	11	Deposit at Post Office Savings Bank	239	0	8
Miss Trower's Fund	16	7	11				
Benevolent Fund	41	3	6				
	£908	3	4		£908	3	4

(Signed) J. E. LOUSLEY,
Hon. Treasurer.

Examined and found correct.
8th February 1945.

(Signed) H. W. PUGSLEY,
Hon. Auditor.

SUMMARY OF PROCEEDINGS OF MEETINGS.

A meeting of the Committee was held on 29th October 1943 in the rooms of the Linnean Society of London, the Chairman and five other members being present. It was agreed that the subscriptions of the Bergen Museum and Oslo University should be treated as paid up to the end of the year, " as a small sign of our appreciation of the work of Norway." The back numbers of Reports had been sent to the Norwegian Ministry. It was decided that very scarce numbers of our Reports should no longer be sold at their face prices, and that the prices to be asked should be settled by the Acting Secretary in consultation with the Treasurer. The Acting Secretary reported that he had visited Oxford and had put the Society's property there into better order. After a complete set of Reports had been set aside as the Society's own set, the best possible fifteen runs had been made up. Most of the reprints had been rearranged so that orders could be carried out more easily, and two copies of each, when available, had been put aside as the Society's own sets, for ultimate arrangement by both subject and author. Further copies of the *Comital Flora* had been bound up.

A meeting of the Committee was held on 24th March 1944 in the same rooms, the Chairman and eight other members being present. The Acting Secretary reported that it had so far not been possible to obtain suitable cupboards in which to store the Society's property at Oxford. It was agreed that a suitable Application Form for membership should be printed, and that a leaflet setting out the aims and work of the Society, together with a short history of its activities, should be prepared. It was considered that a suggested scheme for tax-free subscriptions, designed to increase the Society's income, was not practicable.

At the Annual General Meeting which followed in the afternoon the Chairman and eighteen other members were present. The report of the Acting Secretary, circulated with the notice calling the meeting, was adopted. In his report, which was adopted, the Treasurer said that as a result of the publication of Reports, our income this year might be exceeded by our expenditure, and an increase in membership was very desirable after the war if the scope of the Reports was to be maintained. In their report the Joint Editors invited members to send them any views they may have for the improvement of the Annual Reports, as the Publications Sub-Committee hope to review the whole subject of the contents and lay-out of the Report before the next volume was begun. Work towards a second edition of the *Comital Flora* had been begun and the Editors would be glad to receive information of any errors based on publications available before the appearance of the work in 1932, as well as any unpublished corrections. Mr H. W. Pugsley was again elected Auditor, the thanks of the Society being given to him and also to the Linnean Society for their generous loan of rooms for our meetings.

Owing to the renewed attack on London during last summer no meeting of the Committee was held in October, but, instead, the Committee was circularised and in this way it was decided that instead of the proposed Report for 1943 a Report for 1943-44 should be prepared, and also that if possible the Exchange Section should be restarted with a Distribution in the winter of 1945-46.

A meeting of the Committee was held on 25th March 1945 in the same rooms, the Chairman and nine other members being present. Mr J. S. L. Gilmour was elected to the Editorial Sub-committee in place of Mr N. Y. Sandwith, who had been too busy to attend the meetings. It was decided that no minimum age should be fixed for membership, but that any very youthful candidate should be sponsored by an adult member, individual cases to be considered by the Committee. The five vacancies on the Committee due to three deaths and two transfers to offices were filled, in accordance with the special powers given to the Committee in 1940, as follows: Mr G. M. Ash, Mr P. J. M. Brenan, Miss M. S. Campbell, Dr J. E. Dony, and Mr J. S. L. Gilmour. Only three offers of participation in an Exchange Distribution next winter had been received so far, and decision on the matter was deferred until the autumn. Mr J. E. Lousley and Miss E. Vachell, with power to obtain the assistance of others, were asked to enquire on behalf of the Committee concerning the policy and prospects of restarting excursions. Mrs Foggitt was asked to explore the possibility of holding a Conversazione next November.

At the annual General Meeting which followed in the afternoon the Chairman and twenty-two other members were present. The Reports of the Acting Honorary Secretary, Honorary Treasurer, and Honorary Editor were adopted. To these Reports the Acting Secretary added a request for assistance for Bedford College for Women in the rebuilding of their herbarium destroyed by enemy action in 1940. The Treasurer added that although the assets were at present high and the membership gradually increasing, more members were needed if the present standard of the Reports was to be maintained at the present rate of subscription. The Editor drew attention to the difficulties which arose in dealing with Plant Records for which no voucher specimen had been sent (see his Report). Mr Pugsley was again elected auditor and was thanked for his services. The account of arrangements made by the Committee towards resumption of suspended activities at the conclusion of general hostilities in Europe was introduced by the Chairman, who thought that conditions would not permit return to normal activities for some time after the cessation of hostilities. As the meeting, although surprisingly large, was not fully representative, the Committee had decided to ask the meeting to confirm it in office until March 1946, and on the proposition of Miss C. Longfield, seconded by Mr Gilmour, this was agreed. In order to return to the regular practice of electing four members of Committee to replace the four retiring each year by seniority of service, the following Resolution was proposed: "That the period from March 1939 to March 1946 be deemed to be a single year for purposes of elections of Committee." It was pointed out that as due notice had not been given of this Resolution which, being an emergency measure, is contrary to the Rules, it will need confirmation at the next Annual General Meeting. In response to some suggestions made by the Acting Secretary for dealing with the irregularity, Dr Lawn voiced the view that the irregularities had been required by the emergency and that the A.G.M. would prefer not only to accept them but to express their thanks to the Committee and Officers for serving continuously without respite for so long, and by their labours bringing the Society so satisfactorily through these difficult years, and his remarks were received with acclamation. The Chairman asked for the formal moving of the Resolution, and on the proposal of Miss Vivian, seconded by Miss Campbell, it was adopted and on behalf of the Committee and Officers the Chairman responded to the vote of thanks. The additions made to the Committee, in order to strengthen itself for the tasks of reconstruction, were notified and also the arrangements made concerning Exchange Distribution, Excursions, and Conversazione. The Chairman expressed the thanks of the Society to the Linnean Society for their continued kindness in giving their rooms for our meetings and the meeting expressed its approval. Mr Gilmour drew the attention of the Society to the existence of two maps of the Counties and Vice-Counties of the British Isles, prepared for the *New Naturalist*, obtainable from Adprint Limited, 6 Newman Street, London, W.1, on condition that if used in publications due acknowledgment be made to the *New Naturalist*: two forms are obtainable, one with the vice-county boundaries in black and the other with them in blue so that they will not show in reproduction.

HONORARY ACTING SECRETARY'S REPORT FOR 1943.

The past year has been quiet and uneventful as regards the Society's affairs. A few members have sent in specimens for identification, but most of us have had little opportunity for field work.

Sales of Reports and Reprints have continued, and the list of those available, given on the back cover of the Report now in the press, has been changed to include the more important of those found and set in order during my visit to Oxford last April. Some delay in dealing with orders is inevitable owing to my separation from the stock at Oxford, but Mr Whiting, caretaker at Yardley Lodge, has again dealt with orders most efficiently, and without his help this service could not be extended to members.

The publication of the 1941/42 Report, which will not be long delayed, will clear off the arrears in our publications, and if the Report for 1943 can be produced before the end of the present year, we can hope that conditions will be such that the beginning of the next volume will coincide with the beginning of more normal activities for the Society. I would take this opportunity of thanking all members who have given me assistance during the year.

HONORARY ACTING SECRETARY'S REPORT FOR 1944.

The past year, stirring though it has been in other fields, has for the most part been quiet botanically. Travelling is difficult, the obtaining of accommodation often more so. Plant Records sent in are from comparatively few sources. Probably few members have had much opportunity of botanising away from their well-known immediate neighbourhoods. But we may hope that before another year has passed conditions will have improved and a return to more normal working of the Society have begun.

The Committee has agreed that the Exchange Section should be recommenced as soon as possible, and those interested are asked to collect suitable material when they have the opportunity. For the benefit of new members it is emphasised that the main function of this section is the distribution of critical plants for the study and elucidation of the native (or sometimes alien) flora. Mr J. D. Grose, 18 Regent Street, Swindon, Wilts., has agreed to act as Distributor if the necessary material is available. Members who expect to be able to contribute are asked to notify Mr Grose as early as possible in order that he may make the necessary arrangements if a sufficient response is forthcoming. It is hoped that the Society's Referees will also assist when possible by contributing dried material of interesting forms of the groups in which they specialise.

The restarting of Excursions may be difficult until travel and accommodation become easier, but any suggestions which might facilitate an early resumption would be welcomed.

During the summer the Society was circularised by Dr G. E. Blackman who asked for information concerning the distribution and local abundance of *Euonymus europaeus*, an alternative host of the Black Aphis of Broad Beans: my correspondence indicated that some members were more concerned for the protection of the Spindle Tree than for that of the Broad Beans.

Again I would thank all those who have given me assistance during the year.

A. J. WILMOTT.

December 31st, 1944.

HONORARY TREASURER'S REPORT ON FINANCE AND MEMBERSHIP, 1943.

The year 1943 has seen some further improvement in the affairs of the Society although no publications have been issued. It had been expected that the 1941/42 Report would have been circulated before the end of the year, and if that had been possible the publications would have been brought up to date, and the Balance-sheet would have given a true picture of the financial position. Owing to unforeseen difficulties this Report will not be in members' hands until early in 1944 and its cost, which will be about £150, must be allowed for in considering the present figures.

Subscriptions received during the year amounted to £120 3s 6d which, in view of the fact that the temporary reduction in the rate was still in force, must be regarded as very satisfactory. About £20 of this, however, was paid in the last ten days of December following the circulation of a printed postcard advising members of reversion to the full rate, and this £20 must be regarded as belonging to 1944. On the last day of the year a total of £85 3s 9d stood to the credit of members' subscription accounts in our books, of which £20 was made up of the 1944 payments referred to above. Of the balance only £23 will remain after debiting the 1944 subscriptions, so members may rest assured that there is no hidden liability in this connection.

It is pleasing to notice that the proceeds of the sale of Reprints and Reports remains at a high figure, and for this we are indebted to Mr Wilmott's work in handling the orders and to Mr Whiting at Yardley Lodge for making up and despatching the parcels. There is no doubt that the opportunity of purchasing these back publications is a service of great value to members.

The finances of the Society are largely dependent on the size of the membership, and it is very gratifying to record that here there is further increase in spite of difficult war-time conditions. During 1943 we have been pleased to welcome the following as new members:—Sir Murdoch McLeod, Bt., Rev. A. B. Abell, Rev. W. H. O. Moss, Messrs John Brown, F. R. Browning, John Gurney, R. H. Hall, E. J. Libbey, C. Norman Pope, John E. Raven, G. A. Roberts, C. C. Townsend, B. Verdcourt, C. West, and J. E. Williams; Mesdames A. Bridley, M. S. Campbell (rejoined), D. A. C. Long, M. C. Morgan, and N. M. Whiting. With the addition of two members who were not contacted during the period of reconstruction but who have now been re-instated in the list, this makes a gain of 22 new members during the year. In the same period our losses through death have been rather less numerous than of late but we have received notice of the loss of three Honorary Members, Prof. R. Chodat, Prof. Hans Schinz and Prof. K. H. Zahn; of two Corresponding Members, Messrs George Goode and J. F. Pickard; of two Life Members, Miss A. M. Geldart and Dr A. H. Evans; and of one Ordinary Member, Mrs D. K. Lang. We have received 5 resignations, thus making a total of 13 losses, leaving a net gain of 11 additional members and a total of 352 at the close of the year.

A communication has been received from the Royal Norwegian Ministry of Education with reference to the subscriptions of the Bergen Museum and University of Oslo, and the Committee confirmed my action in replying that we were very pleased to regard these as fully paid up to date. That a Government placed in such difficult circumstances is prepared to interest itself in the botanical work of its people must fill us with the deepest admiration. Members wishing to make enquiries about Norwegian botanists will receive every courtesy if they write to the Royal Norwegian Ministry of Education at Kingston House, Princes Gate, London, S.W.7.

It is extremely gratifying to record the improvement in our membership, which is doubtless largely due to the favourable reception which the 1939/40 Report received in December 1942. The present figure, however, leaves no room for complacency as it must be remembered that after the war it will only be possible to resume full activities on the pre-war scale if the number of members is again raised to the old level. It is therefore to be hoped that everyone will co-operate in drawing their friends' attention to the advantages of membership of the B.E.C., which offers services to amateur botanists of a kind not elsewhere available.

J. E. LOUSLEY, Hon. Treasurer.

December 31st, 1943.

HONORARY TREASURER'S REPORT ON FINANCE AND MEMBERSHIP, 1944.

By the publication of the 1941-2 Report in April 1944 we have been able to reduce the arrears in the issue of the Society's publication by a year, and the fact that this has proved possible with a reduction of less than £20 in the balance of the General Fund must be regarded as satisfactory. The amount of subscriptions received during the year is slightly less than in 1943 in spite of the reversion to the normal rate and at first sight this might appear to be a cause for alarm. The explanation, however, is that a large number of members paid their subscriptions for 1944 out of balances already standing to their credit in the Society's books and this is evidenced by the decrease in such balances of subscriptions paid in advance from £85 3s 9d at the end of 1943 to £24 6s at the end of 1944. Taking this into account there is a very close approximation to the standard subscription revenue which might be expected from the total of subscribing members. Now that the balances resulting from the former reduced rate of subscription have mostly been worked off we may expect to receive a regular income of some £160-£170 a year from this source.

In spite of all economies the present high postage rates remain a heavy charge on the income of the Society and it is hoped that members will assist in saving the Club expense and the Officer's time by always enclosing a stamped addressed envelope when making enquiries which require a reply.

The balance of the General Fund is available for the production of the 1943-4 Report which is now in active preparation and it is hoped that in spite of the increased cost of printing that this Report will be somewhat larger than recent issues.

It is gratifying to be able to report a further increase in our membership to 358. During the year Dr N. Polunin, Dr E. Arthur Saunders, Rev. W. R. Megaw, Lt.-Col. C. R. Congreve, Messrs G. O. Allen (rejoined), W. G. Graddon, D. H. Kent, K. J. F. Park, S. Phelp, Francis Rose, S. M. Walters, the Leeds Central Library, Mrs H. R. Davies and Mesdames J. Lambert and Beryl M. C. Morgan have joined the Society. During the same period we have heard with deep regret of the death of six of our members—Mrs M. Corstorphine and Messrs D. B. Bradshaw, C. E. Britton, H. H. Knight, A. L. Still and J. R. Wallis. The loss is the greater as all these members were contributors to our own or to bryological publications. In addition there have been three resignations, so we show a net gain of six in total membership, after allowing for the loss of two Corresponding Members, Messrs G. Goode and J. F. Pickard, of which we were advised too late for inclusion in the figures given in the last Report.

J. E. Lousley, Hon. Treasurer.

December 31st, 1944.

REPORT OF THE HONORARY JOINT EDITORS FOR 1943.

It was expected that the 1941/2 Report would have been in members' hands before the date of the Annual General Meeting, but shortage of binding staff has delayed matters. We hope that its reception will be favourable. Work has been started on the production of the 1943 Report, which will complete volume xii. The Publications Sub-committee intend to review all matters concerning our Reports—both contents and lay-out—before volume xiii is begun, and it invites all members who have any definite views concerning the improvement of the Reports to communicate them to the Joint Editors, in order that all points of view can be considered. Mr Pearsall continued Dr Druce's methods with some personal modifications, and Mr Hall made further modifications and great improvements. The commencement of a new volume—after the war, we hope—seems to be a good time to make such alterations as may seem desirable in order that the most useful information may be included and presented in the best manner.

Work has been begun towards the preparation of a second edition of the *Comital Flora,* and although very many corrections and additions are already in the annotated copy bequeathed to the Society by Mr Hall, the Joint Editors will be glad to receive information of any *errors*, based on information available before the publication of the book in 1932, as well as any unpublished corrections. Local lists would be of great assistance in checking the records of many common plants in vice-counties not covered by a modern County Flora, and members could also help by checking *Comital Flora* (and perhaps *Topographical Botany* also) with their local Floras and reporting on any discrepancies. The revision of the Plant List cannot be seriously undertaken at the present time, as so many necessary books and specimens are not at present available for consultation.

It is suggested that exchange members still able to carry out some field work should make gatherings suitable for distribution and hold them till next year, when it is hoped that some distribution will be arranged. This, the original, section of the Society's activities, will need to be given a good start as soon as possible after the war, and the accumulation of material ready for the first exchange would help towards this end.

HONORARY EDITOR'S REPORT FOR 1944.

A year ago it was hoped that a Report for 1943 would be produced and published before last Christmas, but the renewed attack on London caused disruption of plans as well as of buildings. When the worst of the onslaught was past and conditions (and people) were more normal, it was evident that it would be almost as easy to produce a Report for 1943-44 and bring ourselves up to date as to carry on with the original plan. During the whole of the year Mr Wallace was very fully occupied with his duties in the R.A.F, and the work devolved on me while I was still recovering from illness. In December he was posted to India. But the printing will begin shortly, and it is hoped that no unforeseen delays will hold up publication. I would thank all those who have assisted me, not least contributors who carried out the requests made in the last Report. [31st December 1944.]

With so much material, both books and specimens, still not available for consultation, it has frequently proved impossible to determine points of nomenclature. If readers note discrepancies between the *British Plant List* and names used in this Report, these may be due to the fact that investigation has shown that the name in the *B.P.L.* is (or may be) wrong, but has failed to show what correction should be made. In such cases, the names used by contributors have sometimes been accepted for the time being, but they are not put in heavy type as requiring a correction to *B.P.L.* The number used, or a synonym cited, will be sufficient to relate the plant concerned to *B.P.L.*

There appears to be a certain difference of opinion concerning the desirability of collecting all additions and corrections to *B.P.L.* into one section of the Report. I had this year thought of limiting that section to changes which required some explanation, but find that some prefer the amount of duplication involved so long as all corrections are brought together. The views of those holding strong opinions on this and similar matters concerning the lay-out and contents of the Reports will be welcomed, as the present Report completes vol. xii, and the Editorial Subcommittee intends to review the whole subject before vol. xiii is commenced. It has been suggested that all matter concerning the plants themselves, which is placed in systematic order—Plant Notes, Plant Records, Abstracts also perhaps—should be put together into one series, even if the different parts were in separate paragraphs preceded by "P.N.," "P.R.," "Abs.," etc. The views on such matters appear to depend partly on the personal interests and methods of work. As already mentioned, any strongly held views will be welcomed, but before sending them, editorial difficulties should be considered, as it would, for instance, be impossible without great labour of recopying, to incorporate 5″ × 3″ Record cards with 8″ × 5″ Plant Notes and MS. of Abstracts.

The section on the Weather and its Results has been prepared these last years by Mr Wallace, and I have kept no notes on the subject. The receipt of some records of unusual flowering times of certain species—information lost if not printed and buried if placed in Plant Records or Plant Notes—has suggested the desirability of placing such phenological observations in a section following the account of the weather. Will members having botanical comments to make on the weather send it for editorial consideration, please?

PLANT RECORDS AND VOUCHERS.—The last Editor, Mr P. M. Hall, was concerned about the necessity of obtaining and preserving vouchers for Plant Records. His comments were printed in the Reports for 1937 and 1938. This is really an important matter. Future botanists may wish to verify the accuracy of our printed Records, and they *should* be able to find the material. I have this year, because I was suspicious, asked for specimens and have prevented really serious errors. One record of *Petasites albus*, already printed (in *Trans. Devonshire Ass. for the Adv. of Science*) proved to be *P. japonicus*, and another of a hybrid Tormentil proved to be an alien *Potentilla* of the *P. inclinata* affinity not in the least like the plant supposed to be recorded. It really is necessary to prevent this sort of error, but how?—unless vouchers are automatically sent. I have expressed the willingness—even the wish—of the British Museum to preserve material of printed records concerning British Plants. I find that vouchers sent by Miss Rawlins to Dr Praeger of her Irish records are often not preserved by him, so that no voucher specimen may now exist. The drying of a specimen is so easy that it is not unreasonable for the Editor to ask those sending Records to send a specimen also.

A. J. WILMOTT.

OBITUARIES.

CHARLES EDWARD BRITTON, A.L.S., was born at Lambeth on 2nd December 1872 and died in hospital at Redhill, Surrey, on 23rd March 1944, after a painful illness. By his death critical botany in Britain has been deprived of one of its most single-minded amateur devotees and a wide circle of correspondents will miss the help which he so freely gave.

The early days of Britton's life were spent in Camberwell—a district which would not appear conducive to the stimulation of an interest in botany. He is known to have attended botanical classes at the Working Men's College, where he later lectured in an honorary capacity, but his knowledge of natural history was largely obtained by self-education. Soon after attaining his majority he contributed his first scientific notes to Carrington's *Science Gossip*, a popular and attractive periodical which appealed to a wide circle of readers from 1894 to 1902.

By 1904 Britton had become a member of this Society, which was then known as *The Botanical Exchange Club of the British Isles*. In that year he contributed 41 sheets to the Distribution conducted by James Groves and the inclusion of highly critical violets and a recently described *Rubus* showed the direction his interests were taking at the age of 32. In May 1904 his first substantial paper entitled " Floral Variations among Surrey Violets " appeared in the *Journal of Botany*, to which he was a regular contributor until his death. He married in 1905 and after living for two years at Raynes Park moved to New Malden, which was convenient for access to his favourite hunting grounds in Surrey. Near his home material was then still obtainable for the purposes of two special collections of the plants of Raynes Park and district, and of the valley of the Beverley Brook, which are of especial value as providing evidence of the flora of much ground which is now built over. Many gatherings bearing the special printed labels of these two series are now in the herbarium of the South London Botanical Institute.

In the succeeding years Britton searched the country in the vicinity of London with diligence and ever-increasing critical acumen. Of the plants of the northern part of Surrey he had an unrivalled knowledge and his notes and published records were widely drawn on by Salmon for his Flora of the county. Unfortunately, many of the localities were recorded in a manner unfamiliar to contemporary Surrey botanists owing to the recorder's puckish delight in using obscure place-names which are not marked on the maps in common use or by a perfectly accurate interpretation of parish boundaries, assigning habitats to parishes to which few botanists would suspect they belonged. In the case of rarities these handicaps to rediscovery may well have been intentional and laudable, but for critical plants a more straightforward and detailed method of describing localities would have proved a boon to others. The editors of future Floras of Middlesex, Essex and Kent will have many of Britton's discoveries to quote—his help with the *Flora of Buckinghamshire* has already been acknowledged by G. C. Druce.

Britton preferred to botanise alone and it was characteristic of his method that he chose to go over the same ground repeatedly year after year, making an ever deepening critical study of the vegetation. In his favourite haunts nothing escaped him as too trivial or too difficult for study, and every bush of *Rosa* or *Rubus* would be examined not once but many times. Occasionally I have met him by chance on his solitary rambles by the station for some favourite critical plant and then a fund of unpublished information would be revealed with a wealth of detail, and often a change of name would be suggested. On such occasions Britton would open his mind to a fellow botanist freely and frankly. Yet the general tendency developed by this solitary botanising was introspective, a tendency to go deeper and deeper into critical botany until he could sometimes see differences which others could not follow, and a failure to share in the knowledge and experience of fellow students in the field.

His main interest was always the flora of the Home Counties and most of his holidays from home, as at Llandudno, Littlehampton, Eastbourne and in Merioneth, were not notable for botanical discoveries, though a holiday at Clacton in 1912 resulted in a useful paper (*Essex Nat.*, *17*, 248-255, 1914). Neither did Britton attempt to utilise the lessons of the modern studies of ecology and genetics in his work—his genius was the observation of differences and not their interpretation.

C. E. Britton first became well known amongst British botanists for his work on *Centaurea* which was published in papers in our *Reports* for 1920, 1921, 1922 and 1926. The following year he produced a paper on the variants of *Veronica Anagallis* and *V. aquatica*, and our 1931 *Report* contained an account of the alien *Asters* with some of which he had become familiar in his Thames-side rambling. His attention was then more especially directed to *Polygonum*, *Galium*, *Solanum nigrum* varieties, *Melampyrum* and finally *Ornithogalum*, on all of which he published valuable papers. In addition he worked critically at *Capsella* at the time when Druce and Almquist were studying the variations of the Shepherd's Purse in Britain, and more recently at *Sedum Telephium* auct. angl. and at other minor groups. His very numerous gatherings of *Rosa* and *Rubus* have proved of great value to Rhodologists and Batologists.

Britton was employed at the G.P.O. on duties which until near the end of his service entailed night shifts, and fairly long hours. On his retirement about 1932 he moved from New Malden to Warlingham to live near his friend A. Beadell in a beautiful part of Surrey which was then little spoiled by speculative building and which he had known since his earliest days as a naturalist. The move to a smaller house involved the disposal of most of his herbarium and some of the plants went to Kew and others to the South London Botanical Institute. Some of the material of the groups in which he was specially interested was retained at that time for use in further study. Britton directed that at his death his specimens of *Galium*, *Melampyrum* and *Polygonum*, together with his manuscript of these groups prepared for the projected *New Students' British Flora*, should be sent to the Royal Botanic Gardens, Edinburgh, where they have now been deposited. He also directed that his material of *Rosa* should be offered to the Royal Botanic Gardens, Kew, and the Director of this establishment has now accepted the offer. The remainder of his herbarium, including the series of *Hieracia*, together with most of his books, has been received by Mr E. C. Wallace.

The work of the deceased on critical groups is commemorated in *Rosa tomentosa* Sm. var. *Brittoni* Wolley-Dod, *Capsella Brittonii* (E. Almquist) Wilmott and *Rubus Brittonii* Barton and Riddelsdell, which were named for him. The highest honour normally available for amateur naturalists was bestowed on him when he was elected an Associate of the Linnean Society on 5th May 1938. Although Britton was justly proud of the honour his retiring nature and the difficulties of war-time travel would appear to have prevented him from taking an active part in the discussions at the meetings of the Society.

The writer's first meeting with C. E. Britton was at a field meeting of the South London Botanical Institute in 1922 and his helpful and encouraging conversation with a young botanist throughout the long 'bus ride home which followed the meeting will long be remembered with gratitude. Britton also attended meetings of the Battersea Field Club and other associations of amateur naturalists and was always kindly and helpful to those who knew less than himself, though he rarely took any prominent part in corporate activities.

Throughout his life he was an excellent walker and even during the last summer of his life he was able to join in quite a lengthy walk and show no sign of fatigue. Although his health had by then become less good, very few people would have supposed that he had attained three score years and ten. His interests were many and included a good knowledge of general Natural History, and particularly Ornithology, of English literature, of American history and a working knowledge of several languages. Throughout life he was handicapped by lack of opportunity but nevertheless through sheer enthusiasm he was able to build up a wonderful critical knowledge of the plants of a limited area and to become recognised as the leading authority on several groups in Britain. As one of the last representatives of the old school of field botanists who devoted their lives to the discovery of minor variants, C. E. Britton will be mourned by a wide circle of amateur naturalists.

He leaves a widow and a son, Mr G. Britton, to whom with his friend Mr Walter Johnson I am greatly indebted for various facts used in the preparation of this appreciation.

J. E. LOUSLEY.

MARGARET CORSTORPHINE (née BUNCLE) (1863-1944). The death of Mrs Corstorphine, which occurred at Arbroath on 17th September 1944, deprives the Society of one of the ablest of British women botanists whose modesty and charm too effectively concealed a remarkable talent. Scotland, and Angus in particular, can ill afford the loss of one who had devoted many years of patient and intensive study to gain an unrivalled knowledge of the flora of her native county. She was born in Arbroath on 2nd April 1863, the youngest daughter of the late Thomas Buncle, who was for many years proprietor of *The Arbroath Guide* and who formed the publishing company which now bears his name. Her early education was received at Arbroath High School and later, in encouragement of her natural tendencies, she was given private tuition in sketching and painting. It was her intention to embark on an artistic career but, apart from a few sketches and water-colours and some illustrations which appeared in *The Queen*, she did not pursue this calling. She felt that she must accept more practical work and readily agreed to assist in the management of a girls' school in Trinidad. On the death of her father, however, she assumed ownership, jointly with a sister, of T. Buncle and Co. and thereafter exercised an able controlling influence in the affairs of the firm. In 1902 she married Robert Henry Corstorphine, who later became managing director. They were a most devoted and happy couple, sharing the responsibilities of conducting a provincial newspaper and the management of a busy publishing firm. The high standard of workmanship owes much to the efforts of Mrs Corstorphine. Their leisure time was almost entirely employed in investigating the vegetation of Angus. Many members of the B.E.C., of which they were enthusiastic members for many years, have to thank them for acquaintance with the floral treasures of the glens and hills around Clova where, in their beautiful Highland home at Inchdowrie, botanists were assured of a ready welcome and kindly hospitality.

With her husband she formed a fairly extensive general collection of British plants and these were presented to the Department of Botany, University of St Andrews, shortly after Mr Corstorphine's death. Their representative herbarium of British mosses and hepatics will be divided. The Angus specimens will go with the fine Angus Herbarium to the University College, Dundee, the remainder are bequeathed to the Royal Botanic Garden, Edinburgh. But Mrs Corstorphine's botanical work was not confined to these islands. Smaller collections, which she made and identified during her travels on the Continent and to the West Indies, will be preserved in the British Museum.

During her life Mrs Corstorphine published a single botanical paper entitled " The Roses of Angus " in *B.E.C. 1933 Rep.* She was, however, a keen student of other critical groups found in Angus though, like many others, she despaired of naming her collections of *Rubi* and *Hieracia*. She kept abreast of the latest taxonomic researches in the British flora and applied them, where possible, to her work on the Angus flora. This is evident from the MS. of the unfinished Flora which is written entirely in her own hand and is certainly, to a very large extent, her own work. At the beginning of the war the MS. was laid aside but, on the death of her husband in March 1942, she was persuaded to resume her work. Though clearly in failing health, she courageously overcame her physical handicaps and frequent lapses in memory to complete a revision of the existing MS. Her great anxiety was to ensure recognition for her husband's work. It was characteristic of her manner that she should seek to belittle her own substantial share. As now left, the MS. comprises, with the exception of most of the Gramineae, the Gynospermae, and the Pteridophyta, an enumeration of the plant records of the county which they were able to trace. These require to be arranged under the sub-county divisions which we decided upon and will almost certainly be augmented by further bibliographical research and examination of herbaria. Mrs Corstorphine realized the amount of work in the field, library and herbarium remaining to be done before the Flora could be finally prepared for publication. In the MS. she has indicated many points requiring elucidation, areas which should be further explored, and deficiencies in the Angus Herbarium. We discussed the final form of the book and had agreed the scope of the unwritten chapters. She was delighted when a specimen page was printed for her. She had some regrets in contemplating the leisurely, though painstaking, way in which she and her husband had applied themselves to their work. Sometime before his death Mr Corstorphine, when asked when the work would be finished, replied, " If we continue as carefully as now it will take 84 years." She told me herself that they were oblivious to the passage of years and felt that they would ultimately complete their task. Unfortunately, this hope was not to be realized, and some years must yet elapse before a worthy memorial volume will appear.

G. TAYLOR.

HUGH NEVILLE DIXON (1861-1944) was born at Wickhams Bishop, Essex, on 20th April 1861 and died at Northampton on 9th May 1944. After taking a 1st class degree in classics at Cambridge in 1883, he became assistant to the Rev. Thomas Arnold, who had a school for the deaf at Northampton, and when Mr Arnold retired in 1884 he succeeded him until he retired in 1914. One of the now rare breed of true naturalists, he was Secretary of the Northamptonshire Naturalists' Society and Field Club from 1886 to 1931. He published his first paper on mosses in 1884, and in 1896 produced *The Student's Handbook of British Mosses* (illustrated by Jameson, who also made the keys), which with editions in 1904 and 1924 remains a standard work. When the Moss Exchange Club, of which he was an original member, was converted into the British Bryological Society, he was elected the first President. He became an authority on the mosses of the world. He had a sound knowledge of the flowering plants of Britain and some parts of the Continent. He was elected vice-president of the Linnean Society in 1928.

A man of wide learning and many interests, he was quiet and unassuming. He was a prominent Congregationalist and a director of the London Missionary Society. He believed in keeping fit, playing hockey until over fifty years of age, and climbing Skiddaw on his 80th birthday. He had walked 55 miles in a day, climbed Snowdon three times on one day, and skated from Northampton nearly to Peterborough (with three submersions on the way). He left his British collections to Kew and his foreign ones to the British Museum.

A. J. WILMOTT.

THOMAS ALFRED DYMES, who died at his home in Letchworth on 29th October 1944 at the age of 78, was a careful amateur experimental botanist. He was the author of a small book, *The Nature-Study of Plants*, published in 1920, which described the experimental field available to amateur botanists who had only limited ground and the simplest apparatus at their disposal, and in this he chose *Geranium Robertianum* as the plant to illustrate his notes on life-history. Dymes grew many of our native British plants from seed and his knowledge of methods of inducing germination was extensive. He published a number of short papers on various aspects of the life-history of native species and his *Notes on the Seeds of the British Dactylorchids* (*B.E.C. 1921 Rep.*, 432-441, 1922) was an attempt to utilise his methods for the purposes of critical taxonomy. Dymes was a member of this Society from 1918 until 1939, when he resigned owing to increasing lung trouble.

J. E. LOUSLEY.

ARTHUR HUMBLE EVANS (1855-1943). By the death of Dr Evans on 28th March 1943 at the age of 88, a notable figure has been removed from natural history circles in this country. Evans was born on 23rd February 1855 at Scremerston, Northumberland, where his father was vicar. His boyhood wanderings along the coast and into the border hills fostered an interest in birds and plants which he maintained throughout his life. In these early days he was fortunate in his association with the well-informed local naturalists and, at school in Durham, in receiving encouragement from Canon Tristram, the eminent ornithologist. Although he had his home in Cambridge for nearly 50 years—later removing to Crowthorne, Berks., where he died—he retained a deep affection for his native borderland and each year returned there to continue his natural history studies. He became a member of the Berwickshire Natural History Club in September 1875 and in 1900 was elected to the office of President. At his death he had retained unbroken membership of the Club for 68 years and since 1929 had been the oldest member. In the Club's history for 1875 appeared his first published paper, a brief list of Border plants, to which he added later lists in 1885 and 1916.

While Evans was one of the foremost British ornithologists of his day, it is for his notable contributions to our knowledge of the British

Flora that he will be remembered in our Society. He had a wide knowledge of our native plants and had seen most of the rarer species growing in their natural habitats. It is sad that his rich fund of information regarding the localities of plants is no longer available.

During his long residence in Cambridge Evans naturally gained a thorough knowledge of the plants of the county and he published (in *Proc. Camb. Philos. Soc., 16*, pt. iii (1911)) *A Short Flora of Cambridgeshire*, which he revised and expanded, with the assistance of specialists, and issued in 1939 (when he was 84) as *A Flora of Cambridgeshire*. To Evans probably must most credit be given for the preservation of Wicken Fen. Between 1890 and 1900 when persistent rumours suggested that the Fen was to be drained, he took a prominent part in preventing interference with its natural features, and when the National Trust acquired ownership, Evans was appointed as Secretary of the local Committee charged with management of the property. Later, when adjoining areas of equal importance were offered for sale, Evans took the initiative in buying them on his own account for preservation and recovered the money afterwards. As a result the National Trust now hold the whole of Wicken Sedge Fen and a considerable part of Burwell Fen. Evans knew these fens intimately and loved their people, plants and animals.

It is not surprising that he formed a close friendship with Alfred Fryer and often accompanied him in exploring the fen dykes and drains for pondweeds. When Fryer died in 1911 only part of his monograph on *The Potamogetons of the British Isles* had been published though his notes (except for the fine-leaved species) only required editing prior to publication of the remaining parts. Evans prepared the MS. of parts x, xi, and xii for the press.

The genus *Arctium* engaged his attention and he published several notes on the elucidation of the British representatives. He had also a very sound working knowledge of the *Rubi* but he did not record any observations on this troublesome group.

Up to a few days before his death he was preparing a list of plants of the Tweed Area which, it was hoped, would ultimately appear as a companion volume to his *Fauna of the Tweed Area*. This project, in which the writer of this tribute was collaborating, had not proceeded very far and, apart from a few introductory chapters adapted from this *Fauna*, consists of a list of plant records—by no means complete—culled from various sources. Without the wide knowledge of the senior author, who had a thorough acquaintance with the area and its vegetation (though he did not preserve specimens), it is doubtful whether the work will be completed. The Tweed basin embraces a large area in a number of counties and there are few enthusiastic field-workers in the remaining local societies. It has been impossible to trace many collections of older botanists who explored the district and a thorough investigation of the Tweed valley and its tributaries would be necessary to confirm old records and prepare an account of the vegetation.

To accomplish this requires the co-operation of resident botanists who would be prepared to examine the botanical resources of Tweed from its source to the sea, to explore the tributary valleys, and to search the high ground of the surrounding hills.

In his later years, owing to an infection which developed on a visit overseas, Evans' power of movement was seriously impaired. This infirmity, however, did not deter him from long expeditions in search of plants and he would hobble along on the arm of a companion and with the aid of a stick. He was most determined to reach the object of his quest and could not easily be diverted by any hazard. His later expeditions—I remember in particular one to Ben-y-Vrackie—were not, at least for him, devoid of danger and hardship but he willingly accepted tumbles and hard knocks as part of the price to be paid for his indulgence.

With his first-hand knowledge of our rarer plants, Evans was a valuable member of the Wild Plant Conservation Board. He was a Fellow of the Royal Society of Edinburgh, a Fellow of the Botanical Society of Edinburgh and a member of its offshoot the Scottish Alpine Botanical Club, at whose annual meetings his store of plant lore was freely drawn upon.

A fuller notice appeared in *The North Western Naturalist*, *18*, 244, plate 4 (1944).

G. TAYLOR.

GEORGE GOODE (1858-1943). Born at Cambridge on 26th October 1858 of Cambridge people, he died there on 21st January 1943. After taking his degree at Cambridge he spent his life in the service of the University, and was curator and indeed creator of the music and map departments in its new library building. His main contribution to botanical work was as Secretary and Editor of the Watson Botanical Exchange Club from 1905 to 1920 inclusive. He then relinquished the Secretaryship and became Treasurer, a post he held until the death of the Club in 1934. He also acted as Distributor for 1931 and 1932. In recognition of these labours he was elected a Corresponding Member of our Society. He was a lover of beautiful specimens (see *Watson B.E.C. 1910/11 Rep.*, 303 (1911), where Salmon, Bucknall, and Marshall all use that adjective to describe one of his contributions). His herbarium, with the exception of a representative collection left to his son, the Rev. R. H. Goode, was given to Nottingham University, a result of his friendship with Prof. Carr, who was an old school friend. Perhaps I may be permitted to take this opportunity of expressing my debt to him for my first instruction in forming a herbarium when I was at school. I still remember his insistence on obtaining good specimens and drying them well, a doctrine I have endeavoured to pass on in my turn. Quiet and reserved, somewhat of a recluse, he made a permanent contribution to British botanical effort.

A. J. WILMOTT.

Henry Herbert Knight (1862-1944) was one of the oldest of our members, but as his chief interests were in cryptogams his name may be less familiar to some than those of others of lesser rank as naturalists. For Knight was one of the old breed of naturalist that becomes less numerous as specialisation increases. He was a mathematician, 7th wrangler, fellow of Clare College, Cambridge, and then mathematics master at Llandovery School. Many Carmarthenshire plants were first found by him. When he retired, in 1907, he went to live with his mother at Cheltenham. In 1909 he joined the Cotteswold Naturalists' Field Club and became one of the original collaborators in the work on the Flora of Gloucestershire, then just resuscitated. He contributed annual lists and undertook a detailed investigation of one of the districts, dealing not only with the Phanerogams but also with mosses, liverworts, and lichens. He first wrote up the collections of earlier botanists—Thwaites, W. Joshua, Holmes, Reader, and Ley, and for twenty years worked throughout the county. In 1932 he became a member of the Club's Botanical Sub-Committee and in 1936 handed over his MS. of the cryptogams to the Club for inclusion in the County Flora. He was one of the original members of the British Bryological Society, a referee in Hepatics for over 20 years, and its President in 1933 and 1934. He was a member of the Moss Exchange Club for 16 years and its Distributor for two years. As a member of the British Mycological Society he attended many of their forays and wrote accounts of the lichens collected on twelve of them between 1923 and 1935. Most of his collections have found a home in the National Museum of Wales at Cardiff. The memory of his encouragement and assistance, and happy companionship, will persist with his friends; it is impossible to overestimate the effect of such a life on the growth of interest in Natural History. I am indebted for information to Dr W. Watson and Mr W. R. Price, who have contributed fuller accounts of Knight to the British Bryological Society's and Cotteswold Club's journals respectively.

A. J. Wilmott.

Lester Vallis Lester-Garland—formerly L. V. Lester (1860-1944). L. V. Lester was born at Swanage, Dorset, on 17th July 1860. His father, who was Rector of Langton Matravers, was one of a little group of enthusiastic naturalists interested in the treasures of the Isle of Purbeck, and his son received an early introduction to the study of botany, which was to be his hobby throughout a long life. He was educated at Sherborne and Magdalen College, Oxford, and after a few years on the staff of St Edward's School, Oxford, and 10 years as Fellow and lecturer at St John's College, became Principal of Victoria College, Jersey, from 1896 to 1911. In 1906 he changed his name to Lester-Garland on the death of his uncle. He died at his home at Bathford House, near Bath, on 23rd March 1944.

Lester joined our Society in 1895 and remained a member until about 1930. For many years he contributed specimens to the Exchange Club, and amongst the earliest of these was *Bromus interruptus*, which he discovered independently and brought to the notice of G. C. Druce. In 1903 he published *A Flora of the Island of Jersey* which, although not one of the largest of our local Floras, deservedly enjoys a high reputation. The arrangement of the work is that of Engler's *Die Natürlichen Pflanzenfamilien*—an innovation which must have required considerable courage at the time, and which is well defended in the Introduction. As a consequence several " new combinations " had to be made. A specially valuable feature of the *Flora of Jersey* is the study of the relation of the flora to that of Europe in general. Lester-Garland published little other botanical work though his study of the variations of *Matricaria inodora* (*Journ. Bot.*, *59*, 170, 1921) deserves special mention. He was a Fellow of the Linnean Society from 1899 to 1912, and from 1918 until his death.

Lester-Garland had a deep knowledge of the classics, of history, and of philosophy, but his interests were even wider—religion (he was a member of the Church Assembly), politics, education, social welfare and the physical world. His herbarium, which occupies 5 large cabinets and 2 smaller cases, is to go to Kew when conditions permit, with the proviso that any duplicate European material shall be sent to the herbarium of Bristol University.

To his widow, Mrs Maud Lester-Garland, I am greatly indebted for information which is incorporated in this appreciation. Further details will be found in Lord Justice du Parcq's note in the *Times* of 12th April 1944, from which other facts have been obtained.

J. E. LOUSLEY.

CECIL VICTOR BOLEY MARQUAND (1897-1942) was born at Richmond, Surrey, on 7th June 1897, and was the only child of E. D. Marquand, author of *The Flora of Guernsey*. He was educated in Guernsey, at Paris, and at Bedford School before proceeding to Cambridge, where he took his B.A. degree in 1919 (M.A. in 1922). During the 1914-18 war he held a commission in the Royal Tank Corps.

For several years after leaving Cambridge he worked as research assistant at the Welsh Plant Breeding Station, Aberystwyth, where he studied the varieties of cultivated oats and published a useful bulletin on the subject. During his stay at Aberystwyth he was interested in the rich bryophytic flora of the Welsh mountains and wrote a paper on the Bryophyta of the arctic-alpine associations in Wales. In 1923 he was appointed to the staff of the Herbarium, Royal Botanic Gardens, Kew. It was intended that he should concentrate on the grasses but after a short period he was placed in charge of the Chinese collections and devoted most of his time to revisions of Eastern Asiastic genera or sections of genera, including *Cyananthus*, *Buddleia*, *Gentiana*, and several others. He also investigated the genus *Cotoneaster* with special reference to the species in cultivation. In addition to the Chinese section he was responsible for the Bryophyta at Kew, a group of which he had an extensive knowledge, much of which had been gained in field work.

Marquand was a keen mountaineer. Though his colleagues sometimes tired of descriptions of his exploits, there is no doubt that he felt happy and well at higher altitudes and in atmospheres more rarefied than that at Kew. He retired in 1939 on grounds of ill-health and went to live in the Isle of Skye. His death occurred, as a result of a boating accident, on or about 1st July 1942. One is glad to think that the last few years of his life were spent in pursuits entirely to his own liking. He never seemed to be entirely fitted for the work of a herbarium botanist though it is difficult to say how much of his frequently expressed discontent was due to inborn temperament and how much to ill-health. Marquand was a past-master in the art of conversation and freely expressed opinions on a diversified range of subjects. An excursion with him was usually enjoyable and stimulating so long as time and route were not considered of major importance.

W. B. TURRILL.

I recently learned more about the tragedy from my friend W. G. Greaves, of Ledbury, whose (then retiring) doctor's wife was with Marquand, and who sent me an extract kindly made by the editor from *The Ledbury Reporter* (of 17th July 1943). Dr Trotter intended to devote his retirement to the study of mosses and Marquand had been searching for a suitable house for the doctor in the West of Scotland. He had written to say that he thought he had found one, and Mrs Trotter, having to visit Glasgow on another matter, went to inspect it. The day before she was to return home, Marquand suggested going out in a motor launch to see the position of the house from the sea. They were seen to be in difficulties some distance from shore and were lost sight of in heavy mist. Remains of the tragedy were subsequently discovered on Priest's Island in the Summer Isles.

A. J. WILMOTT.

JOSEPH FRY PICKARD (1876-1943) was born at Silverdale, Lancashire, and died at Leeds on 18th February 1943. His parents were Leeds people and his father had a draper's and hosier's business in the city. They removed to Leeds when he was about two years old. Pickard's parents were Quakers and he was educated at a Quaker School at Wigton. His interests in natural history in general and birds and flowers in particular were aroused at an early age and had ample opportunities for development during his adolescence when the family went to live for a few years in the country close to Newton-in-Bowland near Clitheroe. This interesting district is one that found scarcely any mention in Lees' *Flora of West Yorkshire* which had recently been published, and its botanical exploration owes much to Pickard's enthusiastic investigations started at this time, and continued as opportunity offered in later years. One of the best of his many discoveries in the area was *Wahlenbergia hederacea* near Dunsop Bridge.

Pickard was sent to Stafford for a year to learn nursery gardening, which he was then contemplating taking up as an occupation, but the project was abandoned, and he returned to Leeds in 1895 to enter his father's business and lived there for the rest of his life. Very soon after his return he made the acquaintance of Dr F. A. Lees and J. G. Wilkinson, the remarkable blind botanist, with both of whom a friendship grew up which lasted throughout their lives. His associations with Dr Lees were close; they made many excursions together and he always acknowledged how greatly he profited from the guidance of his older and more experienced friend. He assisted Lees in putting his herbarium in order prior to its sale to the Cartwright Hall, Bradford, in 1905, and he acted as botanical executor to Lees after his death.

Pickard was a keen collector. His herbarium, which was added to for the remainder of his life (and which was purchased by Leeds University after his death) dates from 1892, when he spent a botanical holiday with friends in Scotland with Blair Atholl as headquarters. The party included Allan B. Hall of Thirsk, a botanist with a good knowledge of the north country and Scottish alpine floras, who was very helpful to Pickard in his early botanical work. During this holiday excursions were made to the Sow of Atholl and to Ben Lawers, where he collected many alpines. He visited Scotland again in July 1900 and met Prof. Bailey Balfour and F. C. Crawford whilst staying at the Clova Hotel. Other holidays were spent in the Lake District, amongst the Welsh hills, in Cornwall; active field work in West Yorkshire, and especially the Bowland area, was kept up for many years until circumstances curtailed his ability to indulge his hobby.

His knowledge of flowers and ferns was almost wholly gained from living plants in the field and dried specimens obtained by exchange from his circle of correspondents, which included many of the best known systematists of his day. The fascinations of diagnosis did not attract him and he was content to rely on Dr Lees or his correspondents for his identifications. Nevertheless, he had a good eye for a plant and the number of records standing to his credit in the *Supplement to the Yorkshire Floras* is some indication of his keenness and success as a field botanist. He was particularly interested in ferns and saw *Lastrea cristata* at Askham Bog in 1893. There is no later record of its having been seen there.

When our member Mr Albert Wilson was busy preparing his *Flora of Westmorland*, Pickard was most assiduous and enthusiastic in collecting records for the work and his assistance receives special mention by the author. In recognition of the help he had so readily given to fellow-botanists he was made a Corresponding Member of this Society in 1942. Active field work had had to be given up many years ago but he retained all his enthusiasm to the end and the acquisition of a specimen to fill a gap in his collection always remained a source of great delight. To his widow we extend our sincere sympathies.

W. A. SLEDGE.

William Till Boydon Ridge, B.Sc. (1872-1943), who was a member of the B.E.C. from 1915 to 1936, was the leading Staffordshire botanist of his day. He lived all his life in Stoke-on-Trent, where he was born on 18th February 1872, and died on 2nd February 1943. He was a schoolmaster by profession and taught biology at the Hanley High School. He was a prominent member of the North Staffordshire Field Club, of which he was twice president. His chief work, "The Flora of North Staffordshire," was published in eight parts as an appendix to the *Transactions of the North Staffordshire Field Club* from 1922-1929. Ridge was not a critical botanist and his work makes no claim to be a standard county Flora, but Druce thought it worthy of a full review in *B.E.C. 1931 Rep.*, 582-3 (1932). It is indeed a useful guide to the botanical riches of North Staffordshire. Ridge made no extensive collection of plants. Fifty of his specimens are preserved in the writer's herbarium and there are some others in the Druce herbarium at Oxford. Manuscript lists of the plants he found in North Staffordshire are in the writer's possession. Ridge was president of the North Western Naturalists' Union for two years. He succeeded Prof. F. E. Weiss in 1931 and was re-elected to the chair in 1932. Obituary notices were published in *Trans. North Staffs Field Club, 77*, 26-28, 1943, and with a bibliography in *North West. Nat.. 19*, Nos. 1 and 2, 73-74. 1944.

E. S. Edees.

Arthur Langford Still, B.A. (1872-1944). Members will hear with very deep regret of the death of Mr A. L. Still, our popular authority on the genus *Mentha* in Britain. He was born at Addington House near Croydon, Surrey, on 3rd April 1872 and educated at Clewer House School, Windsor, Tonbridge School and Christ Church, Oxford, where he gained a First in Botany. In the course of his professional life as an analytical chemist he conducted useful research bearing on the manufacture of cheese in the West Country. Early in the present war he evacuated from his home at Wallington, and after return for a short spell in 1940 he finally left for Cove near Tiverton, Devon, where he made his home until the end. While there he suffered the sad loss of his wife (née Elizabeth Smith). He died rather suddenly on 21st June 1944 after complaining for some time of increasing breathlessness and heart-trouble.

Although apparently interested in field botany throughout his life, it was not until about 1933 when he joined this Society that Still became well known to London botanists. He was elected to our Committee in March 1936 and served until his death. His main interest was in the genera *Mentha* and *Carex*. He published papers on the first named group in the *Journal of Botany* for 1936, 1937, 1938 and 1939, and had undertaken, with Mr E. Metcalfe, to write the account for the *New Students' Flora*; Still's portion was, I understand, completed before his death. Many of the Mints in which he was especially interested were grown for a number of years in his garden at Wallington, where he carefully observed the changes which occurred in cultivation. The account of the genus in the new *Flora of Devon* owes much to his work, and he contributed many notes to our own *Reports.* In his later years he refers repeatedly to the paper by Topitz, " Beiträge zur Kenntnis der Menthenflora von Mitteleuropa " (*B.B.C.*, *30* (1913), Abt. *2*, 138-264), of which he had a separate copy and to which he was perhaps inclined to attach undue importance.

No one who knew Still could fail to be impressed by his intense interest in almost everything connected with country life. Horticulture in nearly all its branches was always in his mind, and his well-kept garden at Wallington was evidence of a practical as well as a theoretical interest. The theory and practice of farming was a frequent topic of conversation; he greatly enjoyed shooting and was an excellent shot with gun and rifle. Doubtless the experience thus gained led to the development of an exceptionally keen eye which served him well in his herborisings. Wherever he botanised, whether in Surrey near his home or farther afield at the Lizard, in South Wales or the Wye Valley, Still always found plants of interest in places where they had not previously been noticed. He threw himself into all his pursuits with an enthusiasm which was not ordinarily restrained by any physical discomfort. A good example of this occurred on one occasion when he joined me for a few strenuous days in Breckland. On the night before we started there was an exceptionally severe late frost which threatened to destroy the fruit crop and despite the prospect before him Still spent the whole night at the unpleasant task of hosing down his trees with cold water in an effort to save the fruit. A younger man might well have avoided the task but Still made the effort, turned up to time next morning, and insisted on carrying out the whole of the projected programme.

Botanists who are familiar with Still's work would be astonished to see with how few books and how little apparatus he carried it out. He preferred to collect his knowledge direct from nature rather than from printed works, and an excellent memory enabled him to dispense with much that others would regard as essential. His method was to collect and study material and then to dry it and distribute it amongst his friends. He therefore never amassed a large general herbarium though about 500 sheets of mints were collected and presented by him to the British Museum (Natural History) in October 1940, and I remember a box of mounted *Carices* the disposition of which is not known. By the kindness of his brother his botanical press containing recent Devon gatherings was handed to me after his death and the contents have been distributed to Mr Wallace and others who knew the collector. During the last year or so of his life he took up the study of Fungi, at first with a view of getting to know the better edible species, and then with a wider interest. Although greatly handicapped by separation from his microscopes and by lack of text-books and boxes in which to send away material to Kew, A. A. Pearson and other mycologists to whom he referred doubtful specimens, his knowledge of the group was apparently improving rapidly at the time of his death.

In A. L. Still many friends have lost a versatile and kindly companion, and an excellent correspondent, To his brother, Mr W. H. Still, who has supplied various facts incorporated in this notice, we would offer our deepest sympathy in his loss.

J. E. Lousley.

Charles Baynard Tahourdin, well known as an enthusiastic student of British Orchids, died at his home at Wallington, Surrey, on 5th July 1942. The son of a barrister-at-law, he practised as a solicitor and his legal training was apparent in all his botanical writings and especially in those dealing with Wild Plant Conservation and in the periphrastic terms in which he deliberately described localities for the rarer plants.

Although he had long been interested in painting wild orchids, it was not until he retired that Tahourdin was able to broaden his interest in these plants which culminated in his *magnus opus*, *Native Orchids of Britain*, published privately in 1925. This book written, as the preface announces, " by an amateur for amateurs," is of value for the series of photographs by the author, and has served to develop the interest of many people in these fascinating plants. Its preparation brought him into contact with a wide circle of botanists, amongst whom he circulated printed annual notes on British Orchids summarising the occurrences of the various species in each year. Some of his best work appeared in *The Orchid Review* for 1927 and 1928. A lifelong bachelor, Tahourdin took a great interest in young people and many youthful botanists will remember his hospitality and encouragement with gratitude. His interest in Wild Plant Conservation was very real, practical, and logical, and led to his association with the late Sir Maurice Abbot-Anderson in the founding of " Flora's League."

His collections of water-colour sketches, photographs and manuscripts relating to British Orchids have been bequeathed to Mr S. G. Riche, while it is characteristic of the interests of this most kindly man that the National Trust and the Society for Promotion of Nature Reserves will benefit from his estate after the cesser of certain life interests.

J. E. Lousley.

Jim Vincent. Many members of this Society will hear with deep regret of the death of Jim Vincent, who died at Norwich on 4th November 1944. Vincent was warden for the Whiteslea Estate bird sanctuary owned by Lord Desborough on Hickling Broad and although his main interest was ornithology he had a good knowledge of the flora of the district, which was freely placed at the disposal of many visiting botanists. There is no doubt that many plants recorded on other authority from Hickling and district were detected first by the keen eye of Jim Vincent.

J. E. Lousley.

John Richard Wallis (1917-1944). The Society is the poorer by the passing of J. R. Wallis on 23rd November 1944 after a long illness cheerfully borne. He had been a member some six years and showed great promise as a critical botanist still in his twenties. The flora of his home district of Lamberhurst, Kent, had been carefully studied and he was enthusiastically taking up a survey of Kent as a whole, while not neglecting the bordering counties. He was beginning a careful study, too, of the genus *Callitriche*, which points to his capabilities. His companionship in the field will be greatly missed by the writer and his friends in Kent, Surrey, and Sussex.

E. C. Wallace.

I should like to add a brief tribute to the memory of John Wallis, whose death in his twenty-eighth year cut short a most promising botanical life. He was born on 26th March 1917 at Lamberhurst, Kent, and, his strength proving unequal to the rigours of school life, was educated at home. About a year before the present war he was articled to a firm of accountants in the City of London and afterwards lived in lodgings at Cheam, returning home to Lamberhurst most week-ends. This arrangement afforded him the opportunity of studying the Surrey flora as well as that around his home and also of having access to London libraries and friends. He never complained of his health though it must have been a severe handicap. His temperament in botanical matters was cautious, critical and careful and he was painstaking to a degree unusual in a man of his age. His herbarium has been kindly presented by his parents to the South London Botanical Institute, and his card index of Kentish records is being handed to Mr Francis Rose for use in connection with the projected new Flora of the county. A note compiled from his records of experiments with *Callitriche* will be found elsewhere in this *Report*.

J. E. Lousley.

BIOGRAPHICAL NOTES.

Bromfield, William Arnold (1801-51). The search for the type specimen of Bromfield's *Stellaria Holostea* L. var. *laciniata* in connection with a paper which appears elsewhere in this *Report* indicates the desirability of a statement as to the present whereabouts of his herbarium. His foreign plants, and especially the North American and Egyptian collections, are known to be at Kew but the British plants including the fine series from the Isle of Wight were presented by Miss Bromfield to the Isle of Wight Philosophical and Scientific Society at Ryde. According to Townsend (*Fl. Hants.*, ed. 2, 27, 1904) these were in the charge of Dr Barrow, late Mayor of Ryde, early in the present century. Stratton in his *Guide to the Natural History of the Isle of Wight*, 1908, states that Bromfield's Herbarium was at the School of Art at Ryde. He goes on to say that " a duplicate collection is in the Royal Herbarium at Kew," which is not strictly true although, of course, some of his distributed British specimens are to be found there. Mr J. W. Long has most kindly made enquiries about the plants which remained in the Isle of Wight and informs me that they passed to the Education Officer and finally, after most of the rarities had apparently been lost, into the charge of Miss G. Bullock of " Glen Alva," Arnold Road, Binstead, near Ryde. Miss Bullock has most kindly searched for the required type without success. If any member can thrown any light on the present whereabouts of the plants which have been abstracted from this collection the information should be put on record: in the meanwhile we are grateful to Mr Long and Miss Bullock for supplying information about the specimens that remain.

J. E. Lousley.

Dillwyn, Lewis Weston (1778-1855). The name of this botanist will be familiar to members as joint author with Dawson Turner of the famous *Botanist's Guide through England and Wales*, the publication of which in 1805 laid the foundations of the general study of topographical botany in this country. He issued two works containing useful lists of the plants growing in the Swansea district and various publications on seaweeds, shells and insects. It was therefore with considerable interest that I learned recently in the course of business that there was a Dillwyn Road in Swansea and, thinking that there must be some connection with the well-known botanist, I wrote to Mrs Foggitt asking if she could ascertain if the road was actually named after him. Her reply contains so much interesting information about the Dillwyn family that it is felt that the following extract should be put on permanent record for the benefit of botanists.

" . . . The connection of the Dillwyns with Swansea goes back to 1778, when William Dillwyn came to Swansea and with a man named

Haynes founded the famous Swansea Potteries. The Dillwyns originally came from Breconshire but some of them emigrated to England and also the United States. Lewis Weston Dillwyn (the botanist) was born in 1778, and died in 1855. He married in 1807 the daughter of Colonel John Llewelyn of Penllergaer; the house is still there. L. W. Dillwyn followed his father's lead as regards the potteries, but brought about great improvements in the designs, and insisted that the artists should take as their models the works of Curtis the botanist, and to copy the flowers as faithfully as possible. It is stated that in consequence no other pottery had such a reputation for fidelity to nature. L.W.D. lived at the Willows, Mount Pleasant, Penllergaer, and also Sketty Hall. His son, Lewis Llewelyn Dillwyn, represented Swansea in the Liberal interest for 37 years and died in about 1892 or 1893. A branch of the family is that headed by Sir Charles Leyshon Dillwyn Llewelyn of Llysdinam, Radnorshire, and a Miss Dillwyn, who was a grand-daughter of the famous L.W.D., died about 12 years ago at a great age. . . . So you can see that the Dillwyns have cut a great swathe in the life of Swansea. L.W.D. himself at the end, I think, lived at the family mansion, Hendrefoilan, which is not far from where I live. The Dillwyns after his days lived there for many years."

Mrs Foggitt informs me that there are at least two streets or roads in Swansea named after the Dillwyn family. It is clear that there are many sources likely to provide further information about this enthusiastic botanist in addition to those cited in the *Biographical Index*, and Swansea Pottery designs will acquire an additional interest to many of us.

J. E. Lousley.

PERSONALIA.

THE RT. HON. H. T. BAKER, P.C.

We feel sure that all members will wish to join in congratulating our Chairman on his election as an Honorary Fellow of New College, Oxford. The occasion was the quincentenary in July 1944 of the *amicabilis concordia* between New College, Winchester College, Eton College and King's College, Cambridge.

R. B. ULLMAN'S HERBARIUM.

Our member Lt. Col. R. B. Ullman generously presented his herbarium to the South London Botanical Institute in February 1944, and it has now been incorporated in the British collection there. Many of the specimens were gathered in the company of the late Patrick M. Hall or received from him by exchange, and the genera *Orchis* and *Viola* are especially well represented. Ullman collected a great deal of useful material, especially in the counties of Cornwall, Hants., and Cambridgeshire, and students of the local floras of those counties should take the opportunity of referring to the collection. Dr E. Drabble had named a specimen of *Viola cantiana* Drabble and as the type in Drabble's herbarium was lost before his death, Ullman's sheet has been deposited with his consent on loan at the British Museum (Natural History) until the specimen of the same gathering in Herb. P. M. Hall, which was bequeathed to the Museum, is available for consultation.

J. E. LOUSLEY.

HERBARIUM AND MUSEUM OF BEDFORD COLLEGE FOR WOMEN.

The herbarium and museum of the Bedford College for Women was completely destroyed during the London " blitz " in 1941, and efforts are being made to obtain the material needed to build up a new herbarium and museum. Almost any kind of contribution would be welcomed, and any members who could send duplicates or collect new specimens are asked to address them to Mrs D. V. Harrison-Church, B.Sc., Department of Botany, Bedford College for Women, Regent's Park, London, N.W.1. Cryptogams as well as Phanerogams are required, and pickled as well as dried material when useful for teaching purposes. If everybody lends a hand we should be able to give them a good start.

A BIBLIOGRAPHY OF THE BRITISH FLORA.

With a view to eventual publication, it is proposed to compile a Bibliography of the British Flora. One section of this, on local botany, would comprise all publications, which it is possible to trace, dealing wholly or partly with the flora of any area within the British Isles. This section would include local floras and works on topographical botany, and all publications, such as local and county histories, guide books, periodicals, and newspapers, etc., in which plant lists of particular areas have appeared; manuscripts of sufficient importance and authenticity would also be listed. Where, however, only incidental mention is made of plant localities. as in many of the standard floras of Britain and in monographs, these would be omitted from this section.

The compilation will entail a large amount of research and will only be possible with the willing co-operation of helpers who have the requisite local knowledge of the literature of their areas.

We should be grateful if those willing to help would communicate with Mr N. Douglas Simpson, Maesbury, 3 Cavendish Road, Bournemouth, Hants, indicating (i) when they can begin work, and (ii) in what areas they are interested and to what libraries and periodicals they have access.

When we see what response is received to this appeal, detailed plans for carrying out the work can be drawn up.

J. S. L. GILMOUR. A. E. WADE. H. S. MARSHALL.
N. DOUGLAS SIMPSON. G. TAYLOR.

FLORA OF ESSEX.

Miss M. S. Campbell, Layer Marney Hall, Kelvedon, Essex, Local Secretary for the County (see *B.E.C. 1933 Report*, 467), is still collecting materials towards a new or revised Flora of Essex, and would be glad to receive and file suitable information.

FLORA OF KENT.

Will members possessing specimens, records, or notes of Kentish plants please notify Mr F. Rose, B.Sc., F.L.S., Boxtree House, East Malling, Kent, who is gathering all data relating to the Flora of Kent? It is hoped, after the course of several years, to publish a new Flora of the county, as Hanbury and Marshall's excellent book (1899) has now become very much out of date; and, owing to lack of information, did not fully refer to all areas of the county. It is proposed to give the new work an ecological bias, so the co-operation of all ecological workers in Kent and surrounding counties would be welcomed. The help of experts on the critical genera would also be much appreciated.

It is thought that the imminent end of the war in Europe makes this, perhaps, a more suitable time for this announcement than before, although work has been in progress on the new Flora for nearly three years.

FLORA OF MIDDLESEX.

Mr D. H. Kent, of 75 Adelaide Road, West Ealing, London, W.13, is collecting material for a new *Flora of Middlesex*, and would be glad to hear from any member who has notes or specimens of Middlesex plants.

FLORA OF THE OUTER HEBRIDES.

Miss M. S. Campbell, c/o Department of Botany, British Museum (Natural History), Cromwell Road, London, S.W.7, now freed from war duties, is resuming her work on the Flora of the Outer Hebrides (see *Journal of Botany, 75*, 88; *B.E.C. 1936 Report*, 217, and *1937 Report*, 440). She would be glad to receive records, notes, and the loan of specimens, especially those collected since 1939, from any of the Outer Isles. She would also be glad if any naturalists planning visits to the Islands would communicate with her as early as possible.

VALERIANA.

Dr Skalinska, at present working at Kew, is anxious to obtain living material of *Valeriana officinalis*, sensu lato, for cultivation and cytological study. She would also be glad of the loan of dried specimens.

CUSCUTA EUROPAEA.

Mr B. Verdcourt is studying *Cuscuta europaea* L. and would be glad to have any interesting facts which other members can give about this plant. Information is particularly needed on the following points: (1) host plants, (2) whether the habitat is usually near water, (3) whether there has in the past four years been any noticeable increase of the plants in old habitats or sudden appearance in new ones.

CHAROPHYTA REQUIRED IN FLUID.

Mr G. O. Allen, of St Oswald's, Enton Green, Godalming, Surrey, hopes to mount some sets of Charophyte slides and would much appreciate material of any species in fluid (very weak formalin). Those species specially wanted are *Nitella capillaris*, *N. tenuissima*, *Tolypella intricata*, *Lamprothamnium papulosum*, *Chara Braunii*, *C. denudata*, *C. rudis*, *C. tomentosa*, and *C. connivens*.

PERIODICALS IN THE DEPARTMENT OF BOTANY, OXFORD UNIVERSITY.

A printed list of the periodicals in the library of the Department of Botany has been prepared for the use of readers. Although the list is not available for sale, it is understood that it is being circulated to a number of institutions outside Oxford and that the authorities are prepared to make volumes available for consultation by responsible persons through the recognised channels. As the library includes many rare periodicals, some of which may not be readily obtainable elsewhere, the privilege is a valuable one and should be brought to the notice of all those undertaking research which is likely to necessitate the consultation of such works. The list includes the titles of the periodicals, volumes available, places and dates of publication and some additional particulars where desirable, and it is to be hoped that other large libraries may follow this example and publish similar lists in an equally convenient form.

J. E. Lousley.

CONTINENTAL BOTANY.

Since 1940 very little botanical news has been available from the Continent and there have been considerable misgivings about the progress of the science, especially in the occupied countries. The liberation of part of Europe in 1944 has made available some information about European botanists and the following facts gleaned from a copy of the *Bulletin de la Société Royale de Belgique*, t. 76, sér. 2, t. 26, fasc. 1 and 2, published in 1944, are reassuring.

The *Bulletin* contains a most valuable illustrated paper by J. Langhe on the species of the group *Carex muricata* L., and another on the exact Belgian distribution of *Himantoglossum hircinum* which may be compared with the work of Hall & Pearsall for Britain (*B.E.C. 1933 Rep.*, 670, 1934). P. Duvigneaud gives a classification of the ecological units of bogs in part of the country, while a reference to a *Premier aperçu sur les groupements végétaux en Belgique* by Louis & Lebrun, published in the *Bulletin de l'Institut agronomique et des Stations de recherches de Gembloux* (t. *11*, 1942, pp. 3-86) strengthens the impression that ecological classification of habitats has made much recent progress. There is also a report on the most excellent "I.F.B." system of recording plant distribution by means of a grid system similar to that with which we are familiar in Dutch periodicals. At the time of going to press 214 squares representing one ninth of the total area of Belgium had been catalogued in a short time.

A second edition of Goffart's *Nouveau manuel de la flore de Belgique* was published in Liège in 1941. It appears that a new Dutch flora was published by Heinsius, Thysse and Kloos in 1942 and that Dr R. Mansfeld has published a new list of German plants (*Ber. d. deutsch. bot. Ges.*, Bd. *8a*, 1940).

J. E. LOUSLEY.

NOMENCLATURE AND CORRECTIONS TO BRITISH PLANT LIST.

A. J. Wilmott.

As in the last Report, this section contains alterations which have been made in the course of preparing the present Report. Some other alterations discovered at the same time to be required have been included.

Again as in the last Report, a few names have been used contrary to *B.P.L.* when it has been impossible in present circumstances to make the full investigation required to determine the valid name, but the *B.P.L.* number will also indicate the plant concerned.

A few other corrections required in *B.P.L.* (indicated as usual by the use of heavy type), which need no explanation, have been made throughout the Report. They are not repeated here and should be sought for by those who seek to keep their *Plant List* in accord with the corrected copy used by the Editors.

So long as alternative nomenclature is, or is believed by the author to be, in accordance with the International Rules of Nomenclature, it will be permitted in papers printed in these Reports, for unfortunately there are still many plants whose specific or other taxonomic rank is still a matter of personal opinion, or for which the valid name is still a subject for debate. But for *Plant Notes*, *Plant Records*, and other matter prepared editorially, the nomenclature of the Society's corrected copy of *B.P.L.* will be adopted

It should have been clearly stated in the last Report that the names in *B.P.L.* distinguished within the species after "a, b, c," etc., are considered to designate *varieties*, and authorities are added correct for the rank of variety. As before, earlier authorities to replace any "comb. nov. ?" will be welcomed for insertion in the next Report.

54 BRASSICA.

14 **Kaber** (DC.) Wheeler—misprinted in *1938 Rep.*, 23, as "*haber*": correct also in *1941-42 Rep.*, 516.

60 CORONOPUS Boehm. in Ludwig Def. Gen. Pl., ed. 3, 32 (1760); *nomen conservandum propositum* 1935.

1 **didymus** (L.) Sm.

2 **procumbens** Gilib.—*vice* tautonym.

88 VIOLA.

1 **stagnina** Kit. sec. Rchb. (*V. persicifolia* auct., ? Roth).—The identity of the plant described by Kitaibel (in Schultes 1814: *Oesterr. Fl.*, ed. 2, 426) has been considered doubtful, but Reichenbach (1839: *Icon. Fl. Germ.*, *3*, t. 4507, 4) figures one of Kitaibel's specimens, which appears to be certainly the species often called *V. persicifolia* Roth (1789: *Tent. Fl. Germ*, *2*, 271). Roth's plant, however, is considered "valde

ambiguum" by Rouy and Foucaud (1896: *Fl. Fr.*, *3*, 9) and others, and until it has been properly typified, *V. persicifolia* Roth must be treated as *nomen dubium*.

100 CERASTIUM.

4 **arcticum** Lange—1889: *Fl. Dan.*, fasc. 50, 7; also 1880-1: in *Overs. dansk Vid.-Selsk., Forh. pro ann. 1880*, nr. 119. *C. Edmondstonii* (Wats.) Murb. & Ostenf. ex Murb. (1898: *Bot. Not.*, 246) is a *nomen illegitimum* (*superfluum*), for Murbeck cites *C. arcticum* Lange as a synonym.

185 RUBUS.

[123 b. *nomen nudum*: delete: =131 b.]

129(2) **adenolobus** W. Watson.—1935: *Lond. Nat. for 1934*, 61) *vice* 129 b.

131 **apricus** Wimm.

b. **sparsipilus** W. Watson.—(1935: *Lond. Nat. for 1934*, 61.)

187 GEUM.

2 **rivale**

b. **pallidum** (Fisch. & Mey.) Blytt.—See Brenan (p). No basis for the " C. A. Mey." of *B.P.L.* can be found by him.

194 ROSA. The list in *B.P.L.* needs thorough revision, and until this can be done the nomenclature of Wolley-Dod's " Revision of British Roses " (1931: *Journ. Bot. Suppl.*) is accepted, with the necessary corrections to *B.P.L.* listed in *1932 Rep.*, 160-162. The varieties of species 7, 8, and 9 are treated as further varieties of *V. canina* L., and those of species 11 as further varieties of *R. dumetorum* Thuill.

12 **Afzeliana** Fr.

e(3) **rupicola** (Harrison) ? comb. nov.—(See Harrison *et al.* 1944: *Vasc.*, *29*, 10.) *Delete* 7r (see *1941-2 Rep.*, 517).

21 **villosa.**

g. **relicta** (Harrison) ? comb. nov.—*R. mollis* var. *relicta* Harrison 1943: *Vasc.*, *28*, 16.—*R. mollis* var. *fallax* Harrison (1932: *Vasc.*, *18*, 25—non A. Blytt).

227 *BLUMENBACHIA.*

1 *Hieronymi* Urban—*vice B. insignis* of *B.P.L.*, see Brenan, p. 789.

252 *FALCARIA.*

*1 *vulgaris* Bernh.—*Vice* tautonym.

258 CHAEROPHYLLUM.

2 **temulum** L.—This, and not *temulentum*, is the original spelling in the *Species Plantarum* (1753: 258).

299 *CRUCIANELLA.*

3 *stylosa* Trin.—See *1939-40 Rep.*, 356: delete 298/6—*Asperula ciliata* Rochel.

352(2) *COSMOS.* Cav., Icon., 1, 9, tt. 14, 79, 1791.

1 *bipinnatus* Cav. Centr. and Trop. Am.—See *Plant Notes.*

353 BIDENS.

2 **tripartita**

d. **radians** (Beck) comb. nov. ?—*Bidens tripartita* f. *radians* Beck; Hegi 1918: *Ill. Fl. M.-Eur.*, *6* (*1*), 518. See *1939-40 Rep.*, 253-4. I have not yet traced the reference to Beck.

380 PETASITES.

1 **hybridus** (L.) G., M. & S. emend Fritsch—1898: *Verh. Z.B.G. Wien*, *48*, 269-270. *Tussilago hybridus* L. 1753: *Sp. Pl.* 866, emend. (incl. *T. Petasites* L. *l.c.*).

383 SENECIO.

10 **vulgaris**

e. **radiatus** Koch.

f. **lanifera,** nom. nov. *S. lanuginosus* Trow. "*S. vulgaris* var. *lanuginosus* (Trow)," *B.P.L.*, ed. 2, *nomen illegitimum*: Druce should have adopted the name var. *radiatus* Koch which he cited, albeit incorrectly, as a synonym. This misuse makes it impossible to use Trow's epithet for the variety, as to do so would create an illegitimate homonym of Druce's illegitimate combination.

396 CIRSIUM.

1 **eriophorum** (L.) Scop.

× **vulgare** (Savi) Airy-Shaw (×*C. Gerhardti* Schultz Bip.) 1849: *Flora*, *32*, 547. See Brenan, p. 792.

400 *GALACTITES.*—Delete *Lupsia* Neck.: Necker's names were not names of "genera."

1 *tomentosa* Moench.—*vice* tautonym.

427 SONCHUS.

2 **arvensis**

b. **glabrescens** G., G. & W.—See Brenan (p. 793). The abbreviation G., G. & W. should be added to p. xxxv of *B.P.L.*

463 LYSIMACHIA.

7 *terrestris* (L.) Britt. St. & Pogg.—1888: *Prelim. Cat. New York*, 34. *Viscum terrestre* L. (1753: *Sp. Pl.* 1023). cf. Britton and Brown (1913: *Ill. Fl. N. Unit. St.*, *2*, 712), "The plant sometimes produces no flowers, but bears bulbils freely in the axils in the autumn, and in this condition was mistaken

by Linnaeus for a terrestrial mistletoe." *L. stricta* Ait. (1789: *Hort. Kew.*, *1*, 199).

467 ANAGALLIS.

2 arvensis

f. **azurea** Wilmott—ut ssp. *phoenicea* (Scop.) Schinz & Kell. sed floribus caeruleis; nec *A. caerulea* Schreb. This is referred to as "f. *caerulea* Lüdi" in Hegi (1927: *Ill. Fl. M.-Eur.*, *5*(*3*), 1870), but the oldest use of "var. *caerulea*" is uncertain and probably refers to *A. caerulea* Schreb., i.e. to *A. foemina* Mill. and not to the blue-flowered variant of ssp. *phoenicea*, for which a different epithet is clearly desirable.

478 CENTAURIUM.

7 **capitatum** (Willd. ex Cham.) Britt. & Rend.—See Druce 1908: *B.P.L.*, ed. 1, nr. 1758, where *Centaurion* Adanson is treated as an orthographic variant of *Centaurium* Hill, which view was also taken by *Gilmour*, see *1937 Rep.*, 453.

482 NYMPHOIDES.

1 **peltatum** (Gmel.) Britt. & Rend.—(1907: *List. Br. Seed-Pl. and Ferns*, 20). Prof. M. L. Fernald points out that Gmelin gave the name *Limnanthemum peltatum* to what he believed to be a new species from Asia, and therefore was under no obligation to adopt any previous name: the epithet *peltatum* is therefore valid.

493 *LAPPULA.*

2 *echinata* Gilib.—*vice* tautonym.

506 MYOSOTIS—See Wade 1944; and 1930: in *B.E.C. 1929 Rep.*, 157→.

1 **scorpioides** L. emend. Hill.—Lectotype in the Clifford Herbarium, British Museum.

a. **memor** (Kittel) Wade, comb. nov. (in litt.).
b. **hirsuta** (H. Braun in Asch.) Wade.
c. **nemorosa** (Bess.) Wade.
c(2) **Reichenbachiana** (Dum.) Wade 1930: 163.
d. **strigulosa** (Rchb.) Schinz & Kell.
e. **laxiflora** (Rchb.) Wade.
f. **serotina** (Hülphers) Wade, comb. nov. (in litt.).

3 **secunda** A. Murray.—*M. repens* G. Don [MS., see Hooker 1821: *Fl. Scot.*, 67] ex Borr. 1834: in *E.B. Suppl.*, *2*, t. 2703, and *M. repens* G. & D. Don 1837: *Gen. Syst.*, *4*, 344, are later homonyms of the illegitimate "*M. repens* Donn. *Cat. Hort. Cantab. Suppl.*" ex Rchb. in Sturm 1822: *Deutsch. Fl.*, *Heft. 42*.

522 *DATURA.*

1 *Stramonium*

b. *Tatula* (L.) Torrey (1824: *Fl. N. and Mid. United States*, 232); see Fernald (1938: *Rhodora*, *40*, 184). The reference given in the last Report for var. *chalybea* Koch should be (1837: *Syn. Fl. Germ.* [ed. 1] 510).

543 VERONICA.

*18 **persica** Poir.—See Lacaita (1917: *J.B.*, *55*, 271-276; also 1918: *J.B.*, *56*, 55); *V. Tournefortii* C. C. Gmel. is a *nomen confusum*.

20 **polita** Fr.—*V. didyma* Tenore is an older name but was (according to Mr C. C. Lacaita) originally given to *V. agrestis* L., at a time when Tenore thought that *V. polita* Fr. was *V. agrestis* L. When Tenore discovered his error his descriptions became changed and he then described *V. polita* under the name *V. didyma*.

578 GALEOPSIS.

2 **Tetrahit**

c. **nigricans** Bréb.—not "*nigrescens*."

615 POLYGONUM.

4 **viviparum**

c. **Roessleri** (G. Beck) Harrison *et al.*—(1941: *J.B.*, *79*, 167).

32 *cuspidatum* Sieb. & Zucc.—Prof. M. L. Fernald has referred me to the paper by Steward (1930: *Rhodora*, *32*, 223-225), who points out that *P. cuspidatum* Willd. was only a herbarium name published by Sprengel (1826: *Syst.*, *2*, 256) as a synonym of *P. acuminatum* Kunth. It was therefore not validly published before *P. cuspidatum* Sieb. & Zucc. (1844-46), which in consequence is not to be rejected as a "later homonym."

616 *FAGOPYRUM.*

1 *sagittatum* Gilib.—*vice* tautonym.

628 EUPHORBIA.

16 **Lathyrus** L.—This, and not *Lathyris*, is the original spelling in the *Species Plantarum* (1753: 457).

84(2). PLATANACEAE.

Lindley, *Nat. Syst. Bot.*, ed. 2, 187, 1836.

640(2) *PLATANUS* L.

1 *acerifolia* (Ait.) Willd.—See *Plant Notes*.

90 HYDROCHARITACEAE.—Revised by J. E. Dandy. As in *B.P.L.* except:—

655 **STRATIOTES** L.

1 **aloides** L.—(N.B., asterisk is omitted: no initial capital).

658 **HYDRILLA** Rich.

1 [**verticillata** (L.f.) Royle. Asia].

b. **pomeranica** (Rchb.) Druce.—No reason to doubt its being native.

669 **ORCHIS.**

11(2) **hebridensis**

×(7) **latifolia** L. sec. Pugsl.—See Harrison (1941C: 298).

×(10) **ericetorum** (Linton) E. S. Marshall.—See Harrison (1941B: 259).

669(3) **HIMANTOGLOSSUM** Koch: Syn. Fl. Germ., 689, 841, 1837—See *1933 Rep.*, 671.

1 **hircinum** (L.) Koch.

674(1) **GYMNADENIA** R. Br. apud Ait. Hort. Kew., ed. 2, *5*, 191, 1813.

1 **conopsea** (L.) R. Br.

b. **densiflora** (Wahl.) Rchb.—t.424, f. 1-11.

c. **borealis** (Druce) Godfrey.—*Monogr. Brit. Orchid.*, 143.

× **Orchis hebridensis.**—See Harrison (1941C: 298).

[2 **odoratissima** (L.) Rich.]—See *1916 Rep.*, 428.

674(2) **LEUCORCHIS** E. Mey., Preuss. Pflanzeng., 50, 1839.

1 **albida** (L.) E. Mey. ex Schur—*Sert.* 72, n. 2703; *Enum. Pl. Transsilv.*, 645.

674(3) **COELOGLOSSUM** Hartm., Handb. Skand. Fl., 329, 1820.

1 **viride** (L.) Hartm.—*loc. cit.*

674(4) **NEOTINEA** Rchb. f., De poll. Orch., 29, 1852.

1 **intacta** (Link) Rchb. f.—*Orchis intacta* Link, in *Schrad., Journ. Bot.*, 322, 1799.

674(5) **PLATANTHERA** Rich. 1818: in *Mém. Mus. Par.*, *4*, 48, 57.

1 **chlorantha** (Custer) Rchb.—1828: apud Mössl. *Handb.*, *2*, 1565. *Orchis chlorantha* Custer, *Neue Alp.*, *2*, 401.

2 **bifolia** (L.) Rich. emend. Rchb.—*Fl. excurs.*, 120.

692 **MAIANTHEMUM.**

1 **bifolium** (L.) Schmidt.—*Convallaria bifolia* L. (1753: *Sp. Pl.*, 316), spelt by Linnaeus with a small b. There is an old genus *Bifolium*, but Linnaeus in his *Index Synonym.* refers this only to p. 946, where *Bifolium minimum* Bauh., *Hist.*, *3*, 534, is cited under *Ophrys cordata* L.

718 **JUNCUS.**

1 **maritimus** Lam. Mr N. Douglas Simpson informs me that the plant of Egypt and Arabia which was indicated by Forskål as *J. spinosus* is distinct from the British plant, being the var. *arabicus* Asch. et Buch. ex Boiss. ("1884": *Fl. Or., 5*, 354), which has been treated as a distinct species by Adamson (1935: *J.L.S., 50*, 10). It is therefore preferable to use Lamarck's name for the British plant.

b. **atlanticus** J. W. White.

c. **congestus** L. B. Hall.

102 ALISMATACEAE.—Revised by J. E. Dandy.—As in *B.P.L.* except:—

729 **ALISMA** L.

1 **Plantago-aquatica** L.

[b=2]

×730/1=×**A. Glueckii** Druce.

2 **lanceolatum** With.

730 **BALDELLIA** Parl.

1 **Ranunculoides** (L.) Parl.—(*Echinodorus Ranunculoides* (L.) Engelm.).

731 **LURONIUM** Raf.—1840: *Autik. Bot.*, 63. (*Elisma* Buchen. 1869).

1 **natans** (L.) Raf.—(*Elisma natans* (L.) Buchen.).

732 **SAGITTARIA** L.

*2 *rigida* Pursh—(*S. heterophylla* var. *iscana* Hiern).—Martin & Fras. 1939: *Fl. Devon*, 637.

733 **DAMASONIUM** Mill.

1 **Alisma** Mill. (*D. stellatum* Pers.; *Actinocarpus Damasonium* (L.) Sm.; *D. Damasonium* (L.) Aschers. & Graebn.).

737 **POTAMOGETON** L. Revision of nomenclature from Dandy and Taylor (Studies of British Potamogetons; *J.B.*, 1938→). Statements for which no reference is given are from unpublished studies by these authors, who regard the numerous varieties listed in the *B.P.L.* as mere states or developmental phases, not as distinct taxonomic groups. This revision covers also the list published by Pearsall (1931: *B.E.C. 1930 Rep.*, 413-415), and has been passed by J. E. Dandy and G. Taylor.

1 **natans** L. (*P. hibernicus* (Hagstr.) Druce).

[d. *terrestris* Gray = 2.]

[×2. Error. *P. hibernicus* (Hagstr.) Druce = 1.]

× 9 = × **P. sparganifolius** Laestad. ex Fr. (*P. Kirkii* Syme).

× 13 = × **P. fluitans** Roth (*P. crassifolius* Fryer; *P. sterilis* Hagstr.).

2 **polygonifolius** Pourr. (*P. oblongus* Viv.).
[× 15. Error. *P. Macvicarii* A. Benn. = 5 × 15.]

3 **nodosus** Poir. (*P. Drucei* Fryer).—D. & T. 1939: 62.

4 **coloratus** Hornem.
× 9 = × **P. Billupsii** Fryer.
× 23 = × **P. lanceolatus** Sm. (*P. perpygmaeus* Hagstr. ex Druce).

5 **alpinus** Balb. (*P. rufescens* Schrad.; *P. Palmeri* Druce).
[×1. Error: a former interpretation of *P. Drucei* = 3.]
[×2. Error. The Channel Is. plant = 2.]
×9 = ×**P. nericius** Hagstr.
×15 = ×**P. Griffithii** A. Benn. (*P. Macvicarii* A. Benn.; *P. nerviger* auct. brit., non Wolfg.).—D. & T. 1939: 282. [*P. Palmeri* Druce = 5.]
×16 = ×**P. prussicus** Hagstr. (*P. Johannis* Harrison).—D. & T. 1941: 100.
×17 = ×**P. olivaceus** Baagöe ex G. Fisch. (*P. venustus* Baagöe ex A. Benn.).—D. & T. 1943: 119.
[×23. Error: a former interpretation of *P. lanceolatus* = 4 × 23.]

[6 =5 × 15.]
[7 =4 × 23.]
[8 =1 × 9.]

9 **gramineus** L. (*P. varians* Morong ex Fryer; *P. falcatus* Fryer).
[b. *falcatus* (Fryer) Druce = 9. Not a hybrid.]
[×1. See 1 × 9.]
[×2. Error. The Kerry plant = 9.]
× 13 = × **P. Zizii** Koch ex Roth (*P. angustifolius* auct. mult., an Bercht. & Presl?; *P. coriaceus* (Mert. & Koch) A. Benn.; *P. Babingtonii* A. Benn.).—D. & T. 1939: 164.
[× 13 × 1. Error: a former interpretation of *P. crassifolius* = 1 × 13.]
× 16 = ×**P. nitens** Weber.
[× 16 × 23 = × *P. Heslop-harrisonii* Clark. No material seen.]

[10 =9. The synonym "? *spathiformis*" belongs to a North American hybrid.]
[11 =9 × 16.]
[12 =9 × 13.]
[×1. Error. *P. crassifolius* Fryer=1 × 13. D. & T. in A. H. Evans 1939: *Fl. Cambr.*, 166.]
[×9. Error. *P. coriaceus* (Mert. & Koch) A. Benn. = 9 × 13.]

13 **lucens** L.
[×1. See 1 × 13.]
[×15. Error. *P. Babingtonii* A. Benn. = 9 × 13.]
× 16 = × **P. decipiens** Nolte ex Koch (*P. salignus* Fryer; *P. Kupfferii* A. Benn.).—D. & T. 1939: 100.

[14 =13 × 16.]

15 **praelongus** Wulf.
× 16 = × **P. cognatus** Aschers. & Graebn.—Taylor & Sledge in *The Naturalist* 1944: 121.
× 17 = × **P. undulatus** Wolfg.—D. & T. 1943: 118.

16 **perfoliatus** L.
× 17 = × **P. Cooperi** (Fryer) Fryer.

17 **crispus** L.
[×15. See 15 × 17. The records from Stirling and Armagh are errors.]
[×16. See 16 × 17.]
×22 = ×**P. Lintonii** *Fryer*.—D. & T. 1939: 310.
[×23. Error. ×*P. Bennettii* Fryer = 17 × 27.]
×27 = ×**P. Bennettii** Fryer.—D. & T. 1939: 309.

18 **compressus** L. (*P. zosteraefolius* Schumach.).

19 **acutifolius** Link.
[×23. Error. The Sussex plant = 25. D. & T. 1940: 2.]

20 **obtusifolius** Mert. & Koch.
× 25 = × **P. Sturrockii** (A. Benn.) A. Benn.—This is the interpretation of Hagstr. 1916: *Crit. Res.*, 117. Restricted to Marlee Loch, E. Perth.

[21 =23.]

22 **Friesii** Rupr. (*P. mucronatus* Schrad. ex Sond.).
[×20. Error. The Surrey and Perth plants both = 20.]
[×23. Error. The Salop plant = 23; the Stirling plants = 23 and 25. D. & T. 1940: 2, 50.]

23 **Berchtoldii** Fieb. (*P. pusillus* auct. mult., non L.; *P. lacustris* (Pearsall & Pearsall f.) Druce; *P. Millardii* Harrison).—D. & T. 1938: 92; 1940: 51; 1944: 121).
[c. *pusillus* var. *similis* A. Benn. = 25. D. & T. 1940: 5.]
[×27. Error. The plants from Northampton, N. Hants, E. Suffolk, Bucks, and W. Kent all = 23. D. & T. 1940: 49.]

24 **rutilus** Wolfg.—D. & T. 1938: 239. [The records from Anglesey and Orkney are errors.]

25 **pusillus** L. (*P. panormitanus* Biv.).—D. & T. 1938: 92; 1940: 3.
[×23. Error. The York and Salop plants both = 23; the Berks plant = 25. D. & T. 1940: 2, 49.]
[×27. Error. The Cardigan plant = 23; the Norfolk plant = 25. D. & T. 1940: 2, 50.]

[26 =20 × 25, *fide* Hagstr.]

27 **trichoides** Cham. & Schlecht.—D. & T. 1938: 166.

28 **pectinatus** L. (*P. interruptus* Kit.; *P. flabellatus* Bab.).
× 30 = × **P. suecicus** Richt.—D. & T. 1940: 145.

[29 =28.]

30 **filiformis** Pers. (*P. marinus* auct. mult., non L.).
[×28. See 28 × 30. The records from Zetland and Orkney ("Scot. 2" of *B.P.L.*) and from Oxford are errors; the plants = 28.]

31 **densus** L.

*32 [*epihydrus* Raf. N. Am.]

b. *ramosus* (Peck) House (*P. Nuttallii* Cham. & Schlecht.; *P. pensylvanicus* Willd. ex Cham. & Schlecht.). N. Am.—Sledge 1941: *Suppl. York. Fl.*, 111.

[33 Error. The British plant (from S. Devon) = 20. D. & T. in Martin & Fras. 1939: *Fl. Devon*, 644.]

738 **RUPPIA** L.—Revised by J. E. Dandy and G. Taylor. Dandy & Taylor in Martin & Fras. 1939: *Fl. Devon*, 646.

1 **spiralis** L. ex. Dumort.—(*R. maritima* auct. mult., non L.).

2 **maritima** L. (*R. rostellata* Koch).

742 *APONOGETON* L. f.—Revised by J. E. Dandy.

*1 *distachyos* L. f. S. Afr.

750 **CLADIUM** P. Browne, Hist. Jamaic. 114 (1756).

1 **Mariscus** (L.) R. Br.—1810: *Prodr. Fl. Nov. Holl.*, 236. *Schoenus Mariscus* L.; 1753: *Sp. Pl.*, 42.

753 **CAREX.**

13 **helodes** Link—This name was used in place of *C. laevigata* Sm. (1800) by Kükenthal in his Monograph (1909: *Pflanzenr. 4(20)*, 655) because he supposed it to have been published in 1799, the date given on the title page. But Mr Nelmes has evidence that it was not published until 1800. It seems probable that *C. laevigata* Sm. will prove to be the valid name, but until that name has been proved to be the earlier it is undesirable to alter *B.P.L.*, especially as *C. helodes* is used in the standard monograph of the genus.

20(2) **tumidicarpa** Anderss.—1849: *Bot. Not.*, 6. This is 20c, "*C. flava* var. *minor* Townsend," which Mr Nelmes considers to be a different species from *C. flava* L. It probably includes 20b, *C. flava* var. *argillacea* Towns., and perhaps 20d.—From E. Nelmes. It has also been referred to as *C. demissa* Hornem. apud Spreng. (1826: *Syst.*, *3*, 822).

22 **serotina** Mérat—Mr Nelmes prefers this name because it certainly refers to the British plant, whereas Mackenzie, Fernald, and Kreczetowicz are all of the opinion that *C. viridula* Michx is somewhat different. Until the group is better known it is desirable to use the name which undoubtedly refers to the British plant.

37 **paupercula** Michx.—1803: *Fl. Bor. Amer.*, *2*, 172. *C. irrigua* (Wahlenb.) Smith ex Hoppe 1826: *Caric. german.*, 72. *C. limosa* var. *irrigua* Wahlenb. 1812: *Fl. lapp.*, 243, t. xv, f. 2.—*C. magellanica* Lam. appears to be specifically distinct from the plant of the northern hemisphere.—From E. Nelmes.

44 **recta** Boott apud Hook.—1840: *Fl. Bor. Amer.*, *2*, 220, t. 222. *C. kattegatensis* Fries 1857: *Ind. Sem. Hort. Upsal.*, *nomen nudum*. *C. salina* var. *kattegatensis* Almq. 1891: *Bot. Not.*, 126. *C. salina* Wahlenb. is now considered to be *C. aquatilis* × *subspathacea* (not British).—From E. NELMES.

51 **rigida** Good.—This name has been used in this Report in accordance with my note (1925: *J.B.*, *63*, 341), based on acceptance of the view that the earlier use by Schrank (1789: *Baier. Fl.*, *1*, 290) was as a variety. Schrank's remarks in the preface (p. 38) appear to have been misread (cf. the *, see pp. 693 & 694). *C. Bigelowii* Torr. ex Schwein. must stand.

56 **echinata** Murray—1770: *Prodr. Stirp. Gött.*, 76. This name was based on a reference to Haller's *Historia* (1768: n. 1566) and a figure in *Fl. Dan.* (t. 284). Both description and figure represent *C. stellulata* Good. That the specimen in Murray's herbarium is not *C. stellulata* Good. does not affect the application of Murray's name, as Mr Nelmes agrees.

61(2) **polyphylla** Kar. & Kir.—1841: in *Bull. Soc. Nat. Mosc.*, *14*, 859. Mr Nelmes states that type material seen by him is conspecific with *C. Leersii* F. Schultz (1870: *Flora*, *53*, 459) non Willd. (1787: *Fl. Berol. Prodr.*, 28; = *C. echinata* Murr. = *C. stellulata* Good.).—It was the only species of the group which was observed on Flat Holm when I visited that island with the Cardiff Naturalists' Society, and in the same year I observed it in thousands on a high roadside embankment near Bristol. It seems certainly a distinct species.

64 **appropinquata** Schumacher—1801: *Pl. Saell.*, 267. *C. paradoxa* [non J. F. Gmel. 1791: *Syst.*, 142, nomen dubium sec. Kükenthal 1909: *Pflanzenr.*, *4(20)*, 762] Willd. 1794: in *Sitzb. Ges. naturf. Freunde*, 39, t. I, f. 1.—This change is adopted by Mr Nelmes from the Russian caricologist Kreczetowicz.

826 FESTUCA.

4 **elatior L.**

b. **pratensis** (Huds.).

7 **rubra.**—See Howarth in Martin and Fraser 1939: *Fl. Devon* 715.

e. **dumetorum** (L.) Howarth.

e. **pruinosa** (Hack.) Howarth.

e(2) **glaucescens** (Heget. & Heer) Richt.

h. *planifolia* Hack.—1882: *Mon. Festuc.*, 140.

7(2) **prolifera** (Piper) Fernald.—See Harrison, J. W. H. (1941B: 269).

10(2) **vivipara** (L.) Sm.—Turesson has described a considerable number of distinct apomict forms which are for the time being best classified under the above name. Some of them have been recognised in, or described from, the British Isles (cf. Harrison, J. W. H. 1941B: 269):—

b. **scotica** (Turess.) comb. nov.

c. **norvegica** (Turess.) comb. nov.

d. **faeroensis** (Turess.) comb. nov.

e. **killinensis** (Turess.) comb. nov.

14 **glauca** Lam.

b. **hebridensis** (Harrison) Harrison *et al.*—1941C: 305. *F. glauca* apm. *hebridensis* Harrison *et al.* 1941B: 269 (nomina nuda).

16 **ambigua** Le Gall—1852: *Fl. Morb.*, 731. If this plant is regarded as a glabrous form of "*F. ciliata* Danth.," that plant must be given a varietal name, as *F. ciliata* had been used twice previously. *F. Danthonii* Asch. & Graebn. (1901: *Syn. 2(1)*, 550) is an illegitimate name as *F. ambigua* should have been adopted in an emended sense.

827 BROMUS.

*16 **secalinus**

*b. **hirtus** (F. Schultz) Hegi—1908: *Ill. Fl. Mittel-eur.*, *1*, 363. *B. mutabilis* var. *hirtus* F. Schultz 1849: *Flora*, *32*, 233. *B. secalinus* subvar. *hirtus* (F. Schultz) Asch. & Graebn. 1901: *Syn. Mitteleur. Fl. 2(1)*, 604. Druce's "*subhirtus*" appears to have been a *lapsus calami*, as no such variety has so far been noted by Mr Hubbard.

830 AGROPYRON. Corrections from Hubbard (1939: in Martin & Fraser; *Fl. Devon*, 727-731).

4 **repens** (L.) Beauv.

a. **obtusum** Syme.—Similar to the next, but pales obtuse with a minute apiculus.

a(2). **arvense** Rchb.—Awnless: pales mucronate.

b. **dumetorum** (Schreb. ex Schweigg & Koerte) Roem. & Schult. —Robust short-awned form.

c. **aristatum** Baumg.—*T. Leersianum* Roem. & Schult. Both glumes and pales attenuated into a long awn twice the length of the glume.

d. **Vaillantianum** (Wulf. ex Schweigg. & Koerte) Roem. & Schult.—Similar to the last but awns much shorter.

j. **subulatum** (Schreb. ex Schweigg. & Koerte) Roem & Schult. —Form with long tapering glumes.

850 × 851 ASPLENOPHYLLITIS Alston (1940: 139).

1×2 **confluens** (T. Moore) Alston—(1940: 139). *Asplenium Trichomanes* var. *confluens* T. Moore ex Lowe 1867: *Our Native Ferns*, *2*, 207, f. 560.

1×4 **microdon** T. Moore) Alston—(1940: 140). *Asplenium marinum* var. *microdon* T. Moore 1855: *Ferns Gr. Brit.*, sub. t. 38.—Delete 4c.

b. **Sinelii** (J. F. Robinson) comb. nov. ?—*Esplenium lanceolatum* var. *Sinelii* J. F. Robinson 1880: *Hardwicke's Science Gossip*, 148. "Said to be intermediate between *obovatum* and *microdon*."—Delete 4d.

851 ASPLENIUM.—See Alston (1940).

[1×5 Doubtfully hybrid: = 1d; possibly = 5.]

2×3? cf. Stansfield 1919: *Brit. Fern. Gaz.*, *4*, 3.—Westmorland ("evidence insufficient").

2× ? **refractum** (T. Moore) Lowe—1858: *Ferns Brit. & Exotic*, *5*, 103, t. 35; T. Moore 1859: *Nature Printed Br. Ferns* (octavo ed.), *2*, 65. *A. fontanum* var. *refractum* (T. Moore) Hook. 1860: *Spec. Filic.*, *3*, 193. *A. ebeneum* var. *refractum* T. Moore ex Lowe 1867: *Native Ferns*, 170.—Cultivated. ? also Scotland.

c. **Claphami** (T. Moore ex Lowe) comb. nov. *Asplenium lanceolatum* var. *Claphami* T. Moore ex Lowe 1867: *Our Native Ferns*, 155. ×*Asplenophyllitis Claphami* Alston 1940, 141—"intermediate between [×] *A. microdon* and *Phyllitis Scolopendrium*." b. and c. possibly back-crosses with *Phyllitis Scolopendrium*.

1×5 **Jacksoni** Alston—(1940: 142). *A. Adiantum-nigrum* var. *microdon* T. Moore 1860: *Brit. Ferns* (Octavo ed. 2), 76, 89. ? *A. Adiantum-nigrum* var. *subconfluens* Stansfield ex Lowe 1867: *Our Nat. Ferns*, *2*, 181, f. 525.

2×9 **Breynii** Retz.—1774: Obs. i. 32 = ×*A. germanicum* Weis. 1770 pro parte.

b. **acutidentatum** (T. Moore) comb. nov.—*A. germanicum* var. *acutidentatum* T. Moore 1859: *Nature Printed Br. Ferns* (octavo ed.), *2*, 129, t. 80B—? ×*A. Breynii* × *septentrionale*.

7×9 **Murbeckii** Dörfl.—1895: *O.B.Z.*, *45*, 223. *A. Rutamuraria* var. *cuneatum* T. Moore 1855. *A. Ruta-muraria* var. *pseudogermanicum* (? Heufl.) Syme 1866, pro parte.—Delete 7c.

PLANT NOTES.

[In the case of direct contributions the name of the author of the note is printed in small capitals. When the note is an abstract, the author's name is followed by the reference, either in full or by date referring to the Bibliography. The abstractor is indicated as under " Abstracts from Literature."

Note to Contributors. Will those sending in Plant Notes please keep to the form adopted in the recent Reports. If the note comes from a publication, and more than one note is extracted from a single paper, first set down the " reference " in the same form as is adopted in the published " References " in the Reports, i.e., author's surname, comma, initials, semicolon, date of publication, colon, title of work, (and if from a serial publication) semicolon, followed by the name (abbreviated) of the serial, the volume, and pages (first and last). The Plant Note itself starts with the *B.P.L.* number and name of the genus or species concerned. If the note concerns one vice-county only, start the note with this information as is done with Plant Records. It would be a great convenience if all notes were prepared by different contributors on slips of the same size, that preferred being 8 inches by 5 inches, the long edge to be treated as the top of the page.—Ed.]

2. Thalictrum. B. Boivin (1944: *Rhodora*, *46*, 339-376) has given an account of " American Thalictra and their Old World Allies." The author finds that " whether . . . in flower or in fruit, accurate descriptions of pubescence always apply and can easily be checked no matter how fragmentary the specimen may be," although " many normally pubescent species do, however, occasionally present glabrous specimens and mature foliage often loses its pubescence." Six types of hair are recognised. The leaf-division is widely variable, and " although each species, when well known, may usually be recognised by the contour of the leaflets " . . . " these differences are not constant and not very easily put into words." Fruits vary but little, and characteristic features are: shape; length and breadth; thickness; length of stipe; number and design of nerves and ridges; number, direction and pubescence of the fruits; thickness of the fruit-wall.

T. minus L. from Greenland (Giesecke) is no doubt an error.

T. alpinum L. is subdivided into varieties.

" Var. *typicum* " [an illegitimate name as several earlier varietal names are cited in synonymy, the earliest being var. *pallidum* Norman (1883: " *Arch. Math. Naturvid.*, *8*, 4 "), referred to as " the early stage of the plant when the leaflets are strongly glaucous beneath "—Ed.] is described as with more or less elongate horizontal stolons, rarely caespitose; roots few, usually scattered; leaflets bright green above, generally very shining not glaucous; ovary usually obovate or subglobose, sessile or subsessile; mature carpels with stalk 5 mm. or shorter or lacking: various British localities are cited. [As the British plant normally has the leaves glaucous beneath, the name var. *pallidum* Norman should be adopted.]

The var. *hebetum* Boivin is used to include seven species distinguished by Greene. The plant is a little stoloniferous, rarely caespitose, with elongate or ascending stolons; roots few, close aggregated; leaflets dull or rarely a little shining above, usually more or less glaucous, sometimes somewhat green; ovaries obovate or oblanceolate, sessile or subsessile: mature carpels with stalk as in " var. *typicum* ": localities from Austria, Switzerland, the French Alps and the Pyrenees are cited, but none from the British Isles.

The var. *stipitatum* Yabe with fruit-stalk .5-2.5 mm. long occurs in India and China.

6. Ranunculus—sect. *Batrachium*. An account of the " Diversity of the reaction to submergence in the Batrachian Ranunculi " is given by R. W. Butcher (1940: *P.L.S. Sess.*, *152*, 180-189). Plants were transferred from mud to submerged conditions and vice versa, and the results are described with some illustrations. Some species such as *R. peltatus* elongate on submergence, to reach the surface of the water, forma *elongatus* Hiern being such a state and not a variety. Other species shown to elongate in this way are *R. sphaerospermus*, *R. Baudotii* and *R. circinatus*. Species not elongating thus are *R. trichophyllus*, *R. Drouetii* and *R. fluitans*. In the experiments described *R. fluitans*, *R. pseudo-fluitans* and *R. trichophyllus* never produced a trace of a floating leaf in three years, but *R. radians* and *R. heterophyllus* always produced them. " *Radians* " and " *Godroni* " would be better placed as " *R. aquatilis* (=*heterophyllus*) var. *radians* and var. *Godroni*."—[Wi.]

36/3. Barbarea vulgaris (L.) R. Br. Fernald (1943: *Rhodora*, 45, 304) considers that there are " four well defined varieties " naturalised in North America, which he separates as follows:—

Pedicels ascending to appressed or erect; siliques erect or strongly ascending, closely overlapping, the racemes dense.
  Siliques (excluding beak) 1.5-3 cm. long. *B. vulgaris* (typical).
  Siliques (excluding beak) 0.8-1.5 cm. long. Var. *sylvestris*.
Pedicels spreading; siliques arcuate ascending to horizontally divergent, not imbricated, the raceme lax and open.
  Siliques (excluding beak) mostly 2-3 cm. long. Var. *arcuata*.
  Siliques (excluding beak) mostly 0.7-1.5 cm. long. Var. *brachycarpa*.

He also recognises var. *arcuata* forma *hirsuta* (Weihe) Fernald with the basal leaves, including petioles, copiously villous-hirsute, and also a forma *plena* Fernald with very many petals and petaloid stamens.—[Wi.]

116/5(2). **Lavatera punctata** All. This species, listed by Dr Burges among aliens found at Burton-on-Trent (p. 818), belongs, like *L. thuringiaca* L. to the sect. *Olbia*, distinguished by solitary axillary peduncles and exserted (conical or hemispherical) carpophore. Its most important characters are its hastate-trifid or tripartite leaves and accrescent calyx with lanceolate-acuminate segments.

Its distribution is from S. France through Italy and the Balkans to Asia Minor and Palestine; also Tunis.

127/4d. GERANIUM PRATENSE L. var. **eboracense** Lees; 1941: *Suppl. Yorks. Floras*, 18. Petals lavender-white with fine darker veins as prominent as in *G. striatum*; leaves neater, hairier, less complexly cut. A parallel to the var. *lancastriense* of *G. sanguineum*. 64, M.W. Yorks.; wayside at Brearton near Knaresborough, 1943, with normal *G. pratense*, E. C. Wallace.

141/1. AESCULUS HIPPOCASTANUM L. " At the end of July the blast from one of these missiles [flying bombs] stripped a chestnut tree in Camberwell of almost all its leaves. Within a very short time a spring-like growth of foliage began to appear, accompanied by ' spikes '; now the tree is in full bloom." [Joyce R. Embury in the *Times*, September 1944].

153/34(2). **Medicago Blancheana** Boiss. See Dr Burges' paper on Burton aliens. Like *M. rotata* Boiss. it has " horizontal triangular-complanate spines " on the fruit, but the fruit is larger, 10 mm. broad, and with the spirals membranaceous, not thick, the face smoothish and the margin lacking a concentric nerve on both sides (see Boissier, 1872: *Fl. Orient.*, *2*, 97). It is a Syrian species.—A. J. WILMOTT.

177. LENS Miller. Two species of Lentil are listed in the second edition of the Plant List as follows: —

1. *L. Lens* (L.) Huth. (*culinare* Med., *esculenta* Moench).
2. *L. nigricans* Gren.

Ascherson and Graebner (*Synopsis*, *6/2*, 996, 1909) use a similar arrangement, but it seems preferable to adopt that of Hegi (*Illus. Fl. Mittel-Eur.*, *4*/3, 1502, 1923) as follows [inverting the order of the two subspecies to agree with *B.P.L.*—ED.]: —

177/1. **Lens culinaris** Medikus (*Ervum Lens* L., *Lens esculenta* Moench, *L. Lens* Huth).

A. subsp. **esculenta** (Moench) Briquet (*Lens esculenta* Moench and *Ervum Lens* L. s.str., *Vicia Lens* var. *typica* Fiori & Paol.). Usually about 2-4 (to almost 5) dm. tall, usually weakly hairy. Upper leaves usually with simple or branched tendrils and about 4-7 pairs of about 1-2 cm. long and 3-8 mm. broad leaflets. Inflorescence with rather thick stem, at most as long as the subtending stem-leaf. Legumes about 12-15 mm. long and 6-8 mm. broad, 1-3 seeded. Seeds about 3½-7 (3-8½ mm.) broad and 2-3 mm. thick, greyish-brown, yellowish, reddish or black.

B. subsp. **nigricans** (M.B.) Thellung (*L. nigricans* Godr., *L. Biebersteinii* Lamotte, *Ervum Soloniense* L., *E. nigricans* Bieb., *E. lentoides* Ten., *E. himalayense* Al. Braun. & Bouche, *Lathyrus nigricans* Lamotte, *Vicia lentoides* Coss. & Germ., *V. nigricans* Janka, *V. Marschallii* Arcang., *V. Lens* Huth var. *Marschallii* Fiori & Paol.).

Stem usually about 1½ to 3 dm. tall, like the stem-leaves with short spreading hairs. Usually all stem-leaves without tendrils, rarely the upper with tendrils, the lower with 2-3, the upper with 4-5 pairs of c. 1 cm. long and 2 mm. broad, linear-lanceolate, scarcely pointed leaflets. Stipules usually toothed. Inflorescence axis longer than the subtending leaf, with long bristles. Flowers about 5 mm. long. Legume about 1 cm. long and 4 mm. broad, usually 2-seeded. Seed 2-3 mm. broad, blackish-brown, marbled with grey.

Not certainly native anywhere, but frequently naturalised in the Mediterranean Region and Western Asia.

It will be noticed that ssp. *esculenta* differs from ssp. *nigricans* chiefly in being less hairy, in the greater development of tendrils, in the shorter peduncles and in the larger legumes and seeds.

Both subspecies have been recorded several times as adventives in Britain—there is a record of ssp. *esculentus* from v.-c. 16, W. Kent; Beckenham Park Place, where it was collected on October 10, 1934, by E. J. Bunnett, later in this Report.

Enthusiasts for adventives should look out for *L. Lenticula* (Schreber) Alefeld, a native of the Mediterranean Region which may be known from the plants described above by the blue (not bluish-white) flowers and by usually hairy fruits, etc.—J. E. LOUSLEY.

178/8. LATHYRUS NISSOLIA L. In the *Wild Flower Magazine* (No. 272, p. 49) the Editor notes that 1943 was a good year for the flowering of this plant. Nearly every other W.F.S. Diary sent in seemed to record it, and it is emphasised that the flower may colour an area one year and be completely absent the next.

216/4. **Myriophyllum heterophyllum** Michx. 63, S.W. Yorks.; in the Halifax end of the canal branch extending up from Salthebble, 1941-1943, H. Walsh (1944: *Naturalist*, 144). This is a North American species bearing flowers in long (" sometimes 18 inches long " according to Britton and Brown, *Ill. Fl. N. Amer.*, *2*, 616) emersed spikes, the bracts oval, elliptic (" linear ovate or lanceolate ") serrate (" rarely entire "), much longer than the flowers. Stamens 4, rarely 6. Carpels with sides usually slightly scabrous. The plants are robust with thick stems and crowded leaves, pectinate-pinnatifid with capillary divisions in 6-10 pairs. [Wi.]

217. CALLITRICHE. About a year before his premature death the late J. R. Wallis had commenced to make a special study of this difficult genus and had begun a series of experiments with a view to obtaining more information about their life-histories and investigating

the effect of environment on morphology. His parents have placed his note-books at my disposal and although the time available before the onslaught of the illness which caused his death had not permitted the completion of any of the experiments the first had proceeded sufficiently far to provide results which are worthy of permanent record.

On 17th October 1943 Wallis gathered 12 fully-grown fruits from plants of *Callitriche stagnalis* growing on mud on the south side of Bayham Lake, East Sussex, v.-c. 14, and placed them in a jar of tap-water. The jar was placed for six days on a window sill exposed to full sun and then transferred to a window ledge indoors. Two of the fruits sank immediately, the remainder became darker in colour (probably due to over-ripening) and floated for a time—all sinking to the bottom of the jar by 23rd January 1944. By this date two carpels had germinated, and a further 15 germinated between then and 20th February, and another five by 23rd April. He noted that the seedlings floated.

Thus of the 48 carpels placed in the jar, 22 had germinated by the time the notes ceased. The germination of *Callitriche* has not often been recorded, and while conclusions should not be drawn from a single experiment under somewhat artificial conditions, these notes are suggestive of a fruitful subject for future research.—J. E. Lousley.

265/4. Oenanthe pimpinelloides L. 16, W. Kent; in quantity on a disused golf-course between Bickley and Petts Wood, where it was discovered by R. W. Hale in 1943. This discovery has provided not only an important N.C.R. but also a useful opportunity of making observations on the life-history of the plant. Mr Hale was able to visit the locality at frequent intervals during the year, and he kindly took me to see the *Oenanthe* on 29th July and 26th August 1944. Before this he sent me flowering specimens and tubers which I noticed were smaller than some other tubers I had seen. As the plant grew in large scattered clumps it was possible to examine the roots without harm, and I therefore asked Mr Hale to send me specimens of the tubers later in the year, which he did. From these it appears that although the tubers are formed in June they gradually increase in size until they reach their maximum development towards the end of October. The fruits ripen very slowly and cannot be regarded as mature until September. A piece of root was planted in my garden and to my surprise put up fresh radical leaves of usual outline in November and these have continued fresh and apparently functional until the present date (29th December) although there have been several very severe frosts. At the time of flowering these radical leaves are usually withered and difficult to find in fresh condition.—J. E. Lousley.

287/2e. Sambucus nigra L. var. viridis Ait. The fruit of this plant starts green, the skin being distinctly green, the sap lighter green and the young seeds ochre: the skin and sap hide the ochre and the fruit looks green (=var. *viridis*). Later the skin and the sap gradually lose their green colour, and the enlarging ochre seeds begin to affect the general appearance. Finally the skin is only a *very* pale green, the sap faintly greenish, and the large ochre seeds show through the translucent surroundings, when it becomes the " var. *leucocarpa*." —A. J. WILMOTT.

308/4. SCABIOSA SUCCISA L. A. Dunston reports that in the neighbourhood of Corfe Castle, Dorset, about 1 in 100 plants have the flowers lilac, and about 1 in 10,000 have them white.—A. J. WILMOTT.

308/5. SCABIOSA ARVENSIS L. 6, N. Somerset; a single plant of a very remarkable "sport" or monstrosity in a hedge-bank above Easton, July 1944, J. P. M. BRENAN and J. N. MILLS.

The following description, for the most part drawn up while the plant was fresh, should convey an idea of its salient peculiarities:—Plant several-stemmed from the base; stems erect; cauline leaves pinnatifid, large, from the axils of the median and upper ones lateral branches arising bearing at their apices each a single, terminal, ± irregular, lilac-blue flower which is sessile or subsessile and subtended by a pair of reduced, entire or coarsely serrate leaves, from the axil of each of which a shorter secondary branch arises, again ending in a single flower and a pair of reduced leaves, which may in turn subtend one or occasionally two tertiary branches. Above the uppermost pair of large cauline leaves the main stem is continued and ends in a similar way, except that, instead of a single terminal flower, there is a cluster of a few (about 2-4) flowers. Each flower on the plant is surrounded by a minute, green, cupular involucel and sometimes by some very small foliage leaves (in addition to the main subtending pair). It can be seen that the normal capitula, at least in so far as the lateral ones are concerned, are replaced by lax, simple dichasia, the latter term being used in the sense defined by Rickett on p. 216 of his interesting and instructive review of the classification of inflorescences in *Bot. Rev.*, *10*, 1944. The appearance of the plant in the field was extraordinary, not at all suggesting the familiar scabious.

An examination of the material in Herb. Druce resulted in finding one sheet of a similar " sport," collected, according to a letter accompanying the specimen, about half-way between Harrogate and York for a school wild flower competition, whence it was sent by R. Stockdale to the late Dr Druce for determination. On the continent this "sport" appears to be well-known. Penzig, in *Pflanzen-teratologie*, *2*, 45, 1894 (under *Trichera arvensis* Schrad.), has a note on plants that appear to be very similar to that which we have described above, and gives various further references; he comments on the way in which the normal appearance of the plant is entirely altered, and remarks that this monstrosity appears to be especially prone to occur in plants decapitated by summer mowing.

The repeated occurrence of such plants encourages speculation about the phylogeny of the capitulum in Dipsacaceae. It is tempting to see in them a dissolution, so to speak, of the capitulum into a more primitive condition, and such a possibility does not appear unreasonable. Whether we see in the present capitulum a contracted and modified compound dichasium, or whether it is possible to postulate a contraction of a simple dichasium to a few flowered capitulum, to which supernumerary flowers have been added, possibly without reference to the original dichasial condition, are interesting possibilities, but questions which it would be rash to answer hastily. It is pertinent, however, that Höck, in Engl. and Prantl, *Nat. Pflanzenf.*, *4* (*4*), 184, 1891, suggests that the capitula of most Dipsacaceae may have been derived from dichotomous inflorescences, but maintains that they cannot have been truly dichasial owing to the absence of a central flower. It may be suggested, however, that the central flower might well have lost its original identity during the evolution of such a modified and specialised inflorescence as the capitulum. Rickett, in the paper previously referred to, regards the dichasium as probably the most primitive form of inflorescence, and derives various other inflorescence types from it, including " many of the ' umbellate ' and ' capitate ' clusters characteristic of Liliaceous and Cornaceous genera " (p. 217); he also notes the unreliability of evidence derived from order of flowering, which is perhaps significant when considering Höck's contention mentioned above. In considering all this, it is certainly true that phylogenetical evidence derived from monstrosities must be accepted with much caution, but it seems likewise reasonable that it should not be ignored, especially when it is repeated and also gives support to theories based on other grounds.—J. P. M. Brenan and J. N. Mills.

352(2)/1. **Cosmos bipinnatus** *Cav.* " *Ic.*, *1*, 10, t. 14, 1791." A native of central and tropical America and widely cultivated. See Sherff, " Revision of the Genus *Cosmos*," *Field Mus. Nat. Hist. Bot.*, ser. 8, 401-447, 1932. Two annual species of this genus are in cultivation and may be distinguished as follows:—

C. bipinnatus Cav. Leaf segments filiform or linear filiform. Ligules pink, crimson or white, 2-4 cm. long.

C. sulphureus Cav. Leaf segments broad, elliptic, lanceolate or linear. Ligules orange-yellow, 2-3 cm. long.

Both natives of the same regions, they are known to gardeners as Cosmea or Mexican Asters.—J. E. Lousley.

354/2. Galinsoga quadriradiata Ruiz. & Pav. var. hispida (DC.) Thell. It is clear from the following records that this plant is either increasing in the London district or else that it has been more often overlooked than formerly seemed probable. 17, Surrey; near Claygate, where it was found on an unofficial ramble of the South London Botanical Institute in the autumn of 1943 and identified from material collected by W. R. Sherrin which is now in *Hb. Mus. Brit.* There was some doubt about the exact locality but from details supplied by Miss M. B.

Whitaker it was found in great quantity by J. E. Lousley and J. E. Woodhead on 2nd September 1944, and material collected on that occasion has been confirmed by J. P. M. Brenan. The plant occurred over several fields and appeared to thrive equally well in cultivations of corn and potatoes, though in the former it had been cut off by the reaper and only the shorter plants were intact. In the autumn of 1944 the plant was brought in by a visitor to the Institute from John Peed's Nursery at Tulse Hill, and a specimen is preserved in the herbarium. 21, Middlesex; Friar's Place, Acton, October 1909, E. Pierce, ex-herb. C. B. Green, *Hb. Sth. Ldn. Bot. Inst.* This specimen, identified by A. Bruce Jackson, appears to be the earliest evidence of the occurrence of the plant in Britain.: Caledonian Road, undated—probably 1944, Dr J. H. Patterson, *Hb. Sth. Ldn. Bot. Inst.*—J. E. Lousley.

It was collected in the garden bed outside the Royal Geographical Society's rooms in Kensington by A. H. G. Alston, 1943, and by me in a window box deposited in a concrete yard, surrounded by high houses, at the back of Margaretta Terrace, Chelsea, 1943. Mr Alston says it is now common in Mayfair.—A. J. Wilmott.

378/16. Artemisia biennis Willd. 4, N. Devon; farmyard at Combe Martin, 1944, H. W. Pugsley, det. A. H. G. Alston, A. B. Jackson, and A. J. Wilmott. This is the same plant as that distributed through the Watson Exchange Club in 1907 (*1907-8 Report*, p. 147, as *A. Tournefortiana* Rchb.) by S. H. Bickham from Ledbury, where it has been noticed for years. The two species are superficially rather alike, but the capitula of *A. Tournefortiana* are much smaller and the flowers are pink, not yellow. Both are weeds in various parts of the world. It is *A. hispanica* Jacq. 1786 non. Lam. 1783.

†383/7. Senecio squalidus L. In the middle of the southern division of Cadogan Place gardens, London, are two hard tennis-courts covered with a red composition—*en tout cas*—which comes from Syston in Leicestershire. At the beginning of the war both these courts, which lie side by side and are each enclosed by wire, were kept in order and played upon so that there was not the faintest sign of a weed of any kind to be seen upon their surfaces.

On 27th September 1940 a small bomb fell in the eastern court and scattered earth on it in places. For this reason it was left exactly as it was and no play was allowed on it. Moss soon appeared on it and in the course of time a few seedling Buddleias, Laburnums, and one or two Acacias also, from seeds blown on to the court from plants and trees in the immediate neighbourhood. In the spring of 1941 a few plants of *Senecio squalidus* appeared on it and during the war have continued to grow all over it until they were so thick that the gardener sometimes scythed them down. He had never seen a *Senecio* other than a groundsel in the garden. He was eventually stopped from mowing them down at the request of lady members of the garden, who said they made such a brilliant show.

There are a few *Senecio squalidus* in the garden at the present time (1944) as parts of it have been given up to the cultivation of vegetables, but these were evidently self-sown from the court.

It is very interesting to see the one hard court (played on regularly) in perfect order and no suspicion of a weed and the other a dense mass of *Senecio squalidus*.—PERCY R. LOWE, comm. A. J. WILMOTT.

383/7×10. ×SENECIO BAXTERII Druce. The spread of *S. squalidus* during the war has resulted in the appearance of plants taken to represent this hybrid in at least three widely separated localities. In May 1943 two specimens were sent as the hybrid by Mr H. J. Howard from Norwich to the Linnean Society's Anniversary Meeting, for exhibition. They were forwarded to me for confirmation but arrived in such withered condition that no satisfactory comparison with *S. vulgaris* could be made, and the same fate attended further material. The specimens superficially resembled *S. vulgaris*, and I could not find any character to separate them with any certainty from that very variable species. Unfortunately they were recorded in the *Proceedings* (*P.L.S. sess. 155*, 175) as " two plants of *S. vulgaris* with intermediate characters," instead of as " two plants with characters intermediate between it [*S. squalidus*] and *S. vulgaris*." In January 1944, Mr N. D. Simpson showed me in his herbarium specimens which he had gathered near Bournemouth and at the time taken to be the hybrid. Having tabulated the characters of the two species, he was unable to find any definite evidence of hybridity and labelled his strong specimens *S. squalidus*. About the same time Mr E. M. Phillips sent me a typescript copy of his paper (to appear in *Trans. Plymouth Inst.*) " The Natural History of the Plymouth Rubble Heaps," in which the (possible) hybrid is mentioned. That the plants, or at least the Norwich ones, are probably hybrids, has been demonstrated by Mr Lindquist, from a study of the cytology, see E. A. Ellis (1944: *Trans. Norf. and Norw. Nat. Soc.*, *15*, 424-5), who states also that the plants are completely sterile and of stronger habit than *S. vulgaris* var. *radiatus* Koch.—A. J. WILMOTT.

396/4×2. ×**Cirsium sabaudum** Löhr (**C. acaule × vulgare = lanceolatum**). 34, W. Glos.; pasture near Marshfield, 1935, J. P. M. BRENAN.

This was recorded in *B.E.C. 1935 Rep.*, 32, 1936. The specimen has since been seen and the identification confirmed by Dr W. A. Sledge.

The Marshfield plant has a stem about 35 cm. high. The leaves are large, up to about 29 cm. long and 7 cm. wide; their lobation resembles that of *C. vulgare* and not that of *C. acaule*, but their indumentum, lacking spinulose hairs on the upper surface, resembles that of the last-named species. The leaves are decurrent on the stem with narrow spinulose-margined wings which in the lower leaves extend downwards for a distance of a little over 2 cm. below the leaf-insertion, while in the upper leaves the distance is shorter; in *C. acaule* var. *caulescens* (Pers.) DC.

the cauline leaves lack such wings. The stem bears six capitula, five of which are borne on short leafy peduncles about 2.5-4 cm. long arising from the median and upper axils, while the sixth is terminal and supported on a peduncle about 5 cm. long. The capitula are thus borne in a racemose fashion and appear to expand in basipetal succession; they are 2.8-3.3 cm. long and 1.3-1.7 cm. wide, the pericline narrowing upwards from a broad base. The ends of the phyllaries for a distance of about 3 mm. are divergent at an acute angle from the pericline, differing thus from the totally appressed phyllaries of *C. acaule*. In the latter species too the outermost and lowermost phyllaries are tipped with a minute spinulose point about 0.75-1 mm. long or less; in the median phyllaries the tips rapidly become even shorter until they are represented merely by diminutive horny apiculi scarcely visible without a lens. In the Marshfield hybrid all the outer and median phyllaries have distinct spinulose tips 1-1.5 mm. long, and those on the median are somewhat longer than those on the outer. The florets of the Marshfield plant had the colour of *C. acaule* and nearly all the achenes appear to be shrivelled and sterile.

Owing to the fact that this hybrid is unmentioned in *B.P.L.*, ed. 2, it was assumed that it had not been previously observed in Britain. However, an earlier record from Coombe Hill, Bruton, on the authority of W. Watson, will be found in E. S. Marshall, *Suppl. Fl. Somerset*, 105, 1914.

A description of a thistle from Chambéry in Savoy said to have the same parentage is given by Naegeli in his *Dispositio Specierum Generis Cirsii*, p. 997, published as an appendix to Koch, *Syn. Fl. Germ. Helv.*, ed. 2, 1844. However, it does not appear to possess quite the same combination of characters as the Marshfield plant, as the leaves are said to be sparsely spinulose above and, except for a slight decurrence, to resemble those of *C. acaule*, while the capitula are said to resemble those of *C. vulgare* but with the phyllaries shorter-spined. Such a reshuffling of characters in the products of different crossings between the same parent species is, of course, not surprising.—J. P. M. BRENAN.

472/1c. LIGUSTRUM VULGARE L. var. **auriflorum** Höfker (1912: *Mitteilungen d. deutschen dendrologischen Gesellschaft*, *20* (1911), 224). This variety was published by Höfker with a brief description in German: flowers yellow, leaves often rounded. It was based on specimens obtained from a nurseryman at Harburg, who had raised it from seed in 1892. Four bushes had been in existence for fifteen years in a hedge in the churchyard at Harburg. The variety had been propagated both by cuttings and from seed. The colour of the flowers was stated to be canary yellow but as the colour of the fruit was not mentioned it is presumably black. Although varieties with yellow and green fruits are known, it is not clear whether these fruit colours can occur in yellow as well as in white flowered plants.—R. MELVILLE. See *Plant Records*: [and *J.B.*, *69*, 312 (1931) for a previous record of this variety in Britain, J. E. LOUSLEY].

517/19. **Solanum chenopodioides** Lam. ("*Ill. Gen.*, nr. 2340"). In 1930 Mr I. A. Williams collected in Jersey, growing alongside *S. nigrum* L., an allied plant which we were unable to name satisfactorily. In 1943, in the course of a visit with the Haslemere Natural History Society to Frensham Great Pond, he observed it again as he was hurrying back to the bus. We returned later in the year to determine whether the fruit turned red or black, a point that had not been settled for the plant collected in Jersey. As in Jersey, it was growing in association with *S. nigrum*, and together we compared the two plants thoroughly and set down their differences. The peculiar plant was subsequently identified by J. E. Dandy as the Chilean species *S. chenopodioides* Lam.

As this group of *Solanum* is very critical, it seems worth setting down in tabular form the differences between the two species occurring on the east side of the road opposite the eastern end of Frensham Great Pond. The most important difference lies in the greatly accrescent calyx, the calyx in *S. nigrum* and its allies (*S. humile*, *miniatum*, etc.) being only slightly accrescent, but the leaves are more definitely sinuate-toothed, and the whole plant is more pubescent, and the fruit never turns black or red.

S. chenopodioides.	*S. nigrum.*
Plant light green, without anthocyan.	Plant medium or dark green, with more or less anthocyan on stems and peduncles.
Stem less stiff, more flexible, densely glandular - pubescent with scattered spreading pilae, often swollen-based on the decurrent leaf ribs.	Plant stiff, woody, glabrous except for short hairs on the decurrent leaf ribs.
Leaves softly villous and glandular, many of the pilae crook-tipped.	Leaves with scattered tiny appressed hairs.
Calyx tube about three-fifths the length of the calyx, with dense spreading pilae (eglandular) often crooked at the tip, and some shorter glandular hairs.	Calyx tube two-fifths the length of the calyx, with short subappressed (or distally slightly spreading) pubescence.
In ripening fruit the tube of the strongly accrescent calyx is still more than half the length of the calyx, but is hemispherical, with strictly ascending teeth.	In ripening fruit the tube is still two-fifths the length of the calyx, but with spreading teeth although there is some accrescence (to 8-10 mm. diam.).
Calyx light green; teeth never spreading horizontally at the base of the young fruit, becoming triangular (a little narrower than an equilateral triangle), sinus between teeth about 100° with rounded base.	Calyx dark (anthocyanin darkened) green; teeth in old flower spreading almost horizontally at base of the young fruit (about 4 mm. spread), three-quarter elliptical : in ripening fruit narrowly four-fifths elliptical (about twice as long as broad), slightly triangular-elliptic at apex, angle of sinus between the teeth variable, acute to rounded, sometimes with a small membranous area.

Corolla variable in diameter, cut to almost three-fifths, white, tissue-papery in consistence; teeth deltoid, acute, separated by very obtuse (more than 135°) sinus; at first patent to arrect, later recurved right back.	Corolla cut to nearly four-fifths, white, less tissue-papery in consistence; teeth narrowly triangular, about 1¾ longer than broad, acute, separated by sinus little more than 90°; reflexed to descending.
Filaments at least two-thirds the length of the chrome anthers, only half the diameter of the (narrower) anthers.	Filaments short, about a fourth to a fifth the length of the (broader) orange-chrome anthers.
Fruit about 7 × 7 mm., subspherical, dark green, shining and areolately veined with pale green (four main veins and numerous connecting veins); never black even when dropped (which they do early), when they are still translucent-skinned, dark from the brown seeds in some purple juice.	Fruit subdepressed-spherical (9 × 8½, 9½ × 9, but sometimes smaller to 7 × 6 mm.), opaque when green becoming slightly shining and faintly veined just before blackening, when it is unveined and slightly shining.
Young seeds from white to brownish-ochre in green fruits.	Young seeds white to pale greenish or pale grey-yellowish-white.

The corolla in both is white with a basal yellowish patch inside and bluish-mauve tinting outside.

Another gathering of this species was made in Suffolk (v.-c. 25) at Felixstowe Dock by Miss M. S. Campbell in 1936.

The plant collected in 1929 by R. Melville and R. L. Smith at Hayle Towans, Cornwall, and doubtfully recorded by them (*1930 Report*, p. 276) as *S. chenopodioides* Lam., is some other species. It lacks the accrescent calyx, characteristic indumentum, etc.—A. J. WILMOTT.

†566/1. SALVIA PRATENSIS L. 28, W. Norf.; a large clump in Mr G. F. Coulton's meadow at Pentney on chalk, 8th June 1944. Origin unknown. This would come under the var. *vulgaris* Rchb. f., *Ic. F. Germ. et Helv.* " Basal leaves oval or elliptic-oblong, cordate, but with a narrow sinus, more or less crenate, not pinnatipartite; calyx small (5-6 mm. long whilst flowering), corolla hermaphrodite, projecting 12-15 mm." The plant from meadowland at Griston, West Norfolk, found by Mr F. Robinson, 21st June 1915, was determined by Dr Druce as var. *modesta* Briquet. " Flowers of *vulgaris*, basal leaves elongated, narrowly oblong, more or less truncate or attenuated at the base." See *B.E.C. 1916 Rep.*, 427.—E. L. SWANN.

577/5. STACHYS PALUSTRIS L. The North-American varieties of this species are described by Fernald (1943: *Rhodora*, *45*, 473-475, pls. 792-794). " Typical Eurasian *S. palustris* L. has the calyx closely viscid-pilose with many gland-tipped hairs mixed with short glandless ones, the latter rarely more than 1 mm. long." It and three of its varieties recognised in Europe are naturalised. The American var. *pilosa* (Nutt.) Fernald has the " calyx long-hirsute as well as short-pilose, the shorter pubescence largely hidden by long whitish and glandless setiform trichomes mostly 1.5-3 mm. long."—[Wi.]

640(2)/1. **Platanus acerifolia** (Aiton) Willd., *Sp. Pl.*, *4*, 474, 1805—based on *P. orientalis* var. *acerifolia* Aiton, *Hort. Kew.*, *3*, 364, 1789. The London Plane is believed to have originated as a hybrid between *P. occidentalis* L. and *P. orientalis* L. and includes many variants, some of which have received special names (see Redher, *Manual of Cult. Trees and Shrubs*, ed. 2, 321, 1940). Although usually raised commercially from layers or cuttings (Webster, *London Trees*, 101, 1920) the London Plane reproduces quite freely from seed and it is a little surprising that it has not previously been added to the *List*. For the occurrence of seedlings in the ruins of the Temple see later in this *Report*.—J. E. LOUSLEY.

641/1. MYRICA GALE L. 6, N. Somerset; several monoecious bushes with androgynous catkins in wet, heathy ground among other bushes and small trees by a " rhine " on the peat-moors, S. of Shapwick railway station, July 1944, J. P. M. BRENAN and Dr J. N. MILLS.

These bushes had all their catkins bisexual, some of the flowers being ♂, others ♀, others mixed, with the ovary sometimes bearing a stamen in addition to the styles. There appears to be no constant correlation of sex with position in the catkin, but " zones " of similar flowers occur and there is frequently a basal ♂ part and an apical part predominantly ♀.

Penzig, in *Pflanzen-teratologie*, *1*, 303, 1894, has a pertinent note on sexual abnormalities in *M. Gale* and gives various bibliographical references; he writes, " Die Pflanze ist normal dioecisch: man findet aber häufig monoecische Individuen, mit männlichen und weiblichen Kätzchen. Auch in denselben Kätzchen können männliche und weibliche Blüthen zusammen vorkommen (die letzteren an der Spitze der Kätzchen); und man hat sogar hermaphrodite Blüthen beobachtet." It will be seen that the latter remarks appear to indicate the state seen in the Shapwick plants.

There are a few other British records for monoecious *M. Gale*. W. Wilson, in *The Phytologist*, *1*, 235, 1842, describes a bush on Risley Moss near Warrington that must be closely similar to the Somerset ones. Druce, in *Fl. Berks.*, 445, 1897, mentions " an androgynous form " near Sandhurst, but he evidently did not preserve a specimen, as an examination of the material in Herb. Druce did not reveal any abnormal bog myrtle. Praeger, in *Fl. N.E. Ireland*, ed. 2, 191, 1938, has an extract from Templeton: " Specimens with the barren and female Catkins on the same plant in great plenty on Laghy Bog, C. Down; these plants may be distinguished by the leaves being exactly spearshaped or their broadest part at the middle whereas the diœcius variety have their broadest part near the apex." Templeton's record and observations deserve reinvestigation; he evidently does not refer to a form with mixed catkins. The leaves on the Shapwick bushes, it should be added, were quite normal in shape. Mr W. J. Lambert, of the School of Forestry, Oxford University, informs me that he has observed monoecious bog myrtle at Sandford Mire, Westmorland, and it was he who first drew my attention to the occurrence of this condition.

The fact that bog myrtle is occasionally monoecious does not appear to be generally realised in this country. The mixture of sexes on the Shapwick bushes gave an odd malformed appearance to the catkins, and this may have led to the rejection of such plants by botanists in the field; the somewhat inconspicuous catkins may also have helped them to remain unnoticed. It is hoped that this note may stimulate closer observation of bog myrtle, so that it may be ascertained whether the poverty of British records of monoecious states indicates a genuine scarcity of the phenomenon, or whether it has been overlooked and Penzig is correct in describing it as frequent.

Since the above note was written, Mr N. Y. Sandwith has informed me that monoecious *Myrica* had been observed previously at Shapwick, and the following relevant account (from J. W. White, "Bristol Botany in 1924," in *Proc. Brist. Nat. Soc., 1924, Ser. 4, 6,* Part 2, 176, 1925) seems worth reproducing:—"*Myrica Gale* L. Is generally described as dioecious, but the careful examination of a number of plants on Shapwick Moor by Miss Roper in the early spring showed that four other variations exist in the arrangement of the sexes. Staminate and pistillate catkins grew on adjoining twigs, or together on the same twig of a bush; while a third mingling of the sexes was noticed one above the other in the same catkin. In addition, catkins were found consisting solely of hermaphrodite flowers." [See also Davey and Gibson (*Proc. Linn. Soc.*, 14th December 1916, pp. 6-7, and *J.B.*, *55*, 63-64.—J. E. LOUSLEY.]

69, Westmorland; Sandford Mire, 1944, W. J. LAMBERT. Specimens kindly communicated to me by Mr Lambert since the above was written show that the distribution of the sexes here is not the same as in the Shapwick plants, but appears to correspond to the condition described by Templeton from County Down. The catkins are thus each unisexual but both sexes are borne on one and the same plant. The number of catkins seen is not sufficient to decide whether there is any correlation of sex with position nor whether an individual branchlet can bear catkins of more than one sex. The foliage on Mr Lambert's specimens is apparently not yet mature, but is evidently of the normal oblanceolate shape.—J. P. M. BRENAN.

650/10d. SALIX ATROCINEREA Brot. var. **ebudium** Harrison (1944: *Vasc.*, *29*, 15, as var. *Ebudium*). A low sprawling shrub with branches and branchlets decumbent, interwoven; leaves narrow, 25 mm. long and 3-9 mm. wide. N. Harris (v.-c. 110), Allt Tomnaval and elsewhere: type in Herb. J. W. H. Harrison.—[Wi.]

669/6. "ORCHIS PARDALINA Pugsl." at Birling Marshes, W. Kent. In June 1943 Mr F. Rose took me to this locality to see what appeared to be this plant, which I have so far interpreted as being *O. Fuchsii* × *praetermissa*. In the marshes there was an abundance of both *O. latifolia*

L. sec. Pugsl. (" *O. incarnata* " auct.) and *O. praetermissa* Druce, and a small amount of *O. Fuchsii* Druce. The *O. latifolia* was all of the flesh-pink form. All possible hybrids of these three species were seen. As the orchids were in great abundance it was possible to pick plenty of specimens for demonstration as we traversed the ground, placing them into six groups in the hand. The groups became increasingly evident as they were added to, and I think that Mr Rose was satisfied by the demonstration of the hybrids When at last we reached the specimens which he had brought me to see as *O. pardalina*, it seemed evident that these, although they would agree with the description of that plant, could be easily fitted into the series already in our hands as *O. Fuchsii* × *praetermissa*. Indeed, there seemed no reason to regard them as anything other than a slightly extreme form of that series. The point I then made to Mr Rose, which I consider of fundamental importance, was that when species hybridise regularly among themselves as these orchids do, three species will produce three hybrid forms, making six forms in all, but four species should (by the simple mathematical law of combinations) produce *six* hybrids (AB, AC, AD, BC, BD, CD) making ten forms in all. If therefore there is at Birling a fourth *species*, " *O. pardalina*," we should have been able to sort our specimens into *ten groups*. We had made six groups, and either had to put the " *O. pardalina* " into one of these or make a seventh. But it is unreasonable to suppose that " *O. pardalina* " alone of these orchids does not make the usual series of hybrids. Seven groups is therefore unreasonable: we must have six or ten. And we could not make ten. Therefore the groups were six, and the " *O. pardalina* " at Birling was *O. Fuchsii* × *praetermissa*.

I have this year received from the Rev. T. Stephenson specimens of " *O. pardalina* " from Kingskerswell, S. Devon, a locality where I had understood that *O. Fuchsii* did not occur. But *O. Fuchsii* was sent with the series of orchids. I have yet to see " *O. pardalina* " growing in, or from, a locality where it could not be a hybrid of *O. Fuchsii*. I find it difficult to believe in a species which can never be found growing by itself. All the other species, both spotted and marsh orchids, can be found growing alone in some locality or other, and if *O. pardalina* is really a species it should be possible to find it growing alone somewhere. So far I have been unable to hear of such a locality, and I should be glad to see series of orchids from any locality where this is believed to occur.

My experience so far has led me to believe that the " ring-spots " [really ring-blotches for the word spots is needed to describe smaller markings] indicate hybrids of *O. Fuchsii*. That species often shows pale-centred blotches. One objection to the interpretation of *O. pardalina* as *O. Fuchsii* × *praetermissa* which has been made to me is the broadness of the labellum. Those who make this objection appear to consider the labellum of *O. Fuchsii* to be narrow. In fact, the labellum of *O. Fuchsii* is broad; it is only the three lobes which are themselves narrow.

The plant at Rudley in Hants which was at one time said to be near " *O. pardalina* " is *O. Fuchsii* × *latifolia* (" *incarnata* "). I convinced P. M. Hall of this when he took me to the locality, and demonstrated to him the breadth of the labellum of *O. Fuchsii* and the reasonableness of expecting hybrids of that species to have broad lips.—A. J. WILMOTT.

669/7×9, b. ×ORCHIS LATIRELLA P. M. Hall var. **roseo-alba** T. Stephenson (1944: *J.B.*, *80*, 131), from marshy sand near the coast of Aberdovey, which has the labellum pale pink, or white and pink, the *O. latifolia* (*O. incarnata* auct.) parent presumably being the pale flesh-pink coloured form seen in the locality.—[Wi.]

669/8×9. × **Orchis Salteri** Steph. T. Stephenson (1943: *J.B.*, *80*, 104) describes this new hybrid, between *Orchis praetermissa* Druce and *O. purpurella* T. & T. A. Steph., from a damp pasture about three miles from Aberystwyth, towards Borth.—[Wa.]. The flowers are intermediate between those of the associated parents, with paler and with less heavily marked labellum, with more rounded lateral lobes, than in *O. purpurella*. The leaves are slightly spotted.—[Wi.]

674/1d. GYMNADENIA CONOPSEA (L.) R. Br. var. **insulicola** Harrison (1941 B: 260). Outer Hebrides, Fuday. "Differs from the type in its lower stature, fewer flowers of a dull reddish purple colour . . . possessing a disagreeable smell." I have seen plants like this in Westerness, and considered them to be small plants of typical *G. conopsea* (L.) R. Br. as opposed to the sweet scented "var. *densiflora*" which appeared to be more common in the Scottish Highlands.—A. J. WILMOTT.

674/1d × 669/11(2). A hybrid of the preceding with *Orchis hebridensis* Wilmott is also recorded from Fuday (*loc. cit.*) without description.

684/1b. NARCISSUS OBVALLARIS Salisb. The abstract on p. 474 of the last *Report* suggests that this plant was always limited to one field near Tenby, but Miss E. Vachell has drawn my attention to a paper—"Contribution towards an Account of the Narcissi of South Wales"—by her father, C. T. Vachell, reprinted from the *Trans. Cardiff Nat. Soc.*, *26*, pt. ii, 1893-4, where a full account is given of the occurrence of this species in Pembrokeshire. It was formerly abundant and more widespread, but it has been almost exterminated owing to its being sold to supply the horticultural market: "about half-a-millon bulbs were sent to London in the course of two years." Photographic plates are given of both *N. obvallaris* and of the double-flowered plant of Penylan, near Cardiff, which is named *N. obvallaris-plenus*.—A. J. WILMOTT.

718/26. JUNCUS PALLIDUS R. Br. (1810: *Prodr. Fl. Nov. Holl.*, 258). Bedford, v.-c. 30: Eaton Socon, one plant with many culms in a gravel-pit, 30th August 1944, J. G. DONY. This species is widely distributed in Australia and New Zealand. According to Vierhapper's classification (in Engler and Prantl; 1930: *Nat. Pfllanzenfam.*, ed. 2, *15a*, 215) it belongs to the section *Genuini* and, more particularly, to the group of species characterised by ribbed culms and many-flowered inflorescences.

This group includes the British species *J. effusus* L., *J. conglomeratus* L., and *J. inflexus* L. (*J. glaucus* Ehrh.); but *J. pallidus* is a much more robust plant than any of these (the culm, in Dony's specimen, having a diameter of 4.5-5 mm. at the point where it emerges from the cataphylls), and furthermore, according to Vierhapper, it differs in the fruits being triseptate but not trilocular. The uppermost cataphyll in *J. pallidus* is not laminiferous, as in the related *J. uruguensis* Griseb., but bears a conspicuous subulate mucro which in Dony's specimen is about 4 mm. long. The many-flowered inflorescence is subtended by an elongated bract which varies greatly in length (in Dony's specimen it is about 10.5 cm. long). The flowers in the fruiting stage are about 4 mm. long: tepals pale, more or less straw-coloured with whitish margins, ovate-lanceolate and acute. The fruit, which slightly exceeds the tepals, is trigonous-ellipsoid, blunt; seeds minute, ferrugineous, obliquely white-apiculate.—J. E. DANDY.

As this species is an ally of both *J. uruguensis* Griseb. and *J. vaginatus* R. Br., it would be interesting to compare Dony's plant with the plants recorded under those names in the *B.P.L.* If any member has specimens identified with either species, will they please send them for examination.—ED.

737/15×16. × **Potamogeton cognatus** Asch. & Graebn. (1897: *Syn. Mitteleur. Fl.*, *1*, 317) = *P. perfoliatus* L. × *praelongus*. A full account of this hybrid, as occurring in N. Lincs. (v.-c. 54) in the parishes of Belton and Crowle, is given by J. M. Taylor and W. A. Sledge (1944: *Naturalist*, 121-123). The same hybrid had been reported as " reserved for further and more detailed study " by J. W. H. Harrison and W. A. Clark (1942: *Vasc.*, *27*, 29) from Crag Lough, Northumberland (v.-c. 67).

The hybrid combines many characters derived from the parent species, especially in the leaves with perfoliate bases and cucullate tips. The shoots persist till the end of the year but develop winter buds as in *P. perfoliatus*. In relative breadth the leaves are intermediate; they have the denticulate margin of *P. perfoliatus* but the venation of *P. praelongus*. In the anatomy of the stem the stele and endodermis is as in *P. perfoliatus* but the cortical bundles as in *P. praelongus*. Flowers were present: previous records do not mention flowers: the pollen was abortive.—[Wi.]

749/2. SCHOENUS FERRUGINEUS L. The Construction Scheme No. 2 of the North of Scotland Hydro-Electric Board will, if carried out, involve considerable changes in the levels of the Rivers Tummel and Garry and their tributaries, and will affect a number of rare Perthshire plants. It is proposed that the level of Loch Tummel should be raised about 17 ft. by the construction of a dam and that its area should be increased. This will almost certainly involve the extermination of *Schoenus ferrugineus* as a British plant unless it can be found elsewhere. The riverside walks near Pitlochry will also be submerged and it therefore appears likely that the excellent flora there will be lost. Past experience indicates that rare plants can rarely adapt themselves to artificial changes in the water level (cf. Red Tarn, Helvellyn, for example) and it is probable that the adoption of this Scheme would have a serious effect on the flora. Further details will be found in *The Times* (10th February 1945) from which some of the above information is taken.—J. E. LOUSLEY.

Preliminary arrangements have been made officially for moving some of the *Schoenus ferrugineus* for replanting should this Hydro-Electric Scheme be put into effect.—ED.

753/21. CAREX LEPIDOCARPA Tausch. 28, West Norfolk; very common in the very wet parts of local fens on chalk formations. Mr Nelmes writes: "Norfolk supports Gloucestershire in establishing that typical *C. lepidocarpa* favours a chalk or lime formation. In the Severn Vale, on clay, and on the Old Red Sandstone of the Forest of Dean area, *C. flava* L. var. *minor* Towns. replaces *C. lepidocarpa*." In *B.E.C. 1934 Rep.*, 992, Mr Lousley writes: "In my experience *lepidocarpa* only grows in habitats approaching to very wet fen, and it would be interesting to know if others agree."—E. L. SWANN.

753/25(2). **Carex glacialis** Mackenzie (=*C. pedata* Wahl. non Linn.). "Apparently very rare in the mountains of Central Rhum," J. W. H. Harrison (1944: *Vasc.*, *29*, 15). Dried and living specimens deposited at Kew; determination confirmed by E. Nelmes.—[Wi.]. Placed by Kükenthal (1909: *Pflanzenr.*, iv. *20*, p. 495) in the *Eu-digitatae*, it is distinguished from the other British representatives by having its culms lateral as in *C. digitata* and *C. ornithopoda*, but having its utricles glabrous. It is an Arctic and Subarctic plant stretching from Greenland across Iceland, Scandinavia, and N. Asia to Alaska. It is described as from 5 to 15 cm. high, stiff, smooth, leafy below with very narrow rigid channelled leaves shorter than the culm. The spikes are 3-4, the terminal one male, subsessile, linear, 4-6 mm. long, the others close set and female, subsessile or the lowest shortly stalked, oblong, 4-6 mm. long and laxly 2-5 flowered. The male glumes are oblong obtuse, pale fuscous with broad white-hyaline margin. The female glumes orbicular-ovate obtuse or subacute, black-purple with green keel and very broad hyaline margins. Utricles slightly exceeding the glumes and black-purple at the top (straw-green below), orbicular-ovate inflated-trigonous, 2 mm. long, shining and glabrous, unveined, abruptly constricted into a short black-purple beak with hyaline subentire beak. Nut orbicular-ovate turgid-trigonous, dark brown with thickened green angles. Stigmas 3. —A. J. WILMOTT.

753/41. CAREX ATRATA L. "Specimens agreeing with a description of "f. *gelida* Sch." were found in the mountains of Rhum; ("E. Nelmes det.")—(J. W. H. Harrison, 1944: *Vasc.*, *29*, 16). Kükenthal (1909: *Pflanzenr.*, iv, *20*, 398) merely describes Schur's plant as 6-12 cm. high with 1-3 shortened oval spikelets.—[Wi.]

753/461. CAREX ACUTA L. var. **staminifera** Boott—with 2-3 stamens protruding from the utricle which is split on one side. 42, Brecon; 1943, J. A. Whellan; apparently only previously found in Yorkshire in 1867 and on the continent.—E. NELMES.

753/59. CAREX OTRUBAE Podp. The following characters distinguishing this from *C. vulpina* L. are additional to those given in the *1939-40 Rep.*, 264:—Ligule longer than broad, elongated-inverted-V-shaped, not overlapping the margins of the leaf; hyaline membranous front of the leaf-sheath not glandular dotted nor wrinkled; utricles smooth under a lens, not readily dropping at maturity.—E. NELMES.

753/59(2). CAREX VULPINA L. Characters contrasting with the above:—Ligule broader than long, truncate-deltoid, overlapping the margins of the leaf; hyaline membranous front of the leaf-sheath sometimes partly covered with minute yellowish or reddish glandular dots, sometimes marked with transverse wrinkles; utricles seen under a pocket lens (×10) to be densely papillose, readily dropping at maturity.—E. NELMES.

753/68. CAREX DIVISA Huds. 28, W. Norf. On Wolferton Marshes in 1940, among many normal plants, one was gathered showing a monstrosity in the form of proliferous utricles. Normally, in any species the female spikes bear in the axil of each bract a secondary shoot; the axis of this is included in the utricle together with the pistil which is borne in the axil of the bract. In the abnormal form, the secondary axis was found to be elongated and bore another but smaller utricle and nut. Such aberrations are not uncommon; indeed, it is the normal feature of *C. microglochin* Wahl. Instances of this monstrosity, however, in *C. divisa*, so far as can be ascertained, have not been noticed before.

Notes on abnormality in the Cyperaceae (kindly supplied by Mr Nelmes) have been published by Caruel F. (Observations organogéniques sur la fleur femelle des *Carex*; in *Ann. Sci. Nat.*, ser. v, *1*, 104-111, t. 8, 1867), Thiselton-Dyer, W. T.; On the perygynium and seta of *Carex* (*J.L.S. Bot.*, *14*, 154-6, t. 12, 1874) and Ridley, H. N. (A monstrosity of *C. glauca*; *ibid.*, *20*, 45-6, 1883).—E. L. SWANN.

783/1. CALAMAGROSTIS EPIGEIOS (L.) Roth. Contrary to the distributional data given by most authorities, this species, at least in West Norfolk, is far less common than *C. canescens* (Wigg.) Gmel. emend. Druce (*C. lanceolata* Roth). Whereas *C. canescens* is often met with and indeed is the dominant species on one small fen at Blackboro' End near King's Lynn, I have to record *C. epigeios* from one station only, near the level crossing over the Beach Road at Snettisham.—E. L. SWANN.

797/1. CYNODON DACTYLON (L.) Pers. On the 6th of August 1944 I found a large colony of this grass by the roadside at Castle Rising. Measuring 18 feet by 3 feet and with many young plants on the edges, it must be three or four years old and slowly spreading. Although a rare plant with us, it is a common cosmopolitan plant in the warmer (not tropical) parts of the whole earth, abundant by waysides, in vineyards, and in the Cape Province cultivated as a lawn grass. It has become naturalised in America.

Two possible explanations of its introducton can be formulated. Two or three years ago a tobacco warehouse on the docks at King's Lynn suffered a direct hit by a canister of incendiaries. As the crow flies, the docks are three miles south-west of Castle Rising. The terrific heat from this fire would cause convection currents and seeds of this grass which would probably be in the tobacco would be conveyed by the south-west wind then prevailing to the spot at Castle Rising. The ground there is relatively high. No shading occurs. Therefore, the young plants would not suffer from extremes of frost and moisture. Whereas this grass usually has 4-5 digitate spikes, in this station they range from 4-3. The second theory also has a war background. Not far from Castle Rising is an American camp. The freight cars often take their loads of goods (shipped from America) from King's Lynn station. Leaving the town, the drivers would be obliged to travel slowly until they reached tho Castle Rising road. There they would accelerate, especially on the first small hill, and the consequent draught would be most likely to liberate and distribute the seeds from the packages. Just past the first small hill is to be found this grass.—E. L. SWANN.

824/2. POA PRATENSIS L. var. A variety remarkable for its glaucous leaves and inner lemmae divided to the base was found on Leziate Fen, West Norfolk. This fen is on chalk and the dominant grass is *Deschampsia caespitosa* (L.) Beauv., the innumerable tussocks of which make very rough going. In the hollows between the tussocks, this variety of *Poa pratensis* is plentiful. Mr Hubbard has only once before seen this variant and that was from the Isle of Wight, where also it was growing on chalk. It is not the var. *arenaria* Parn., which is a plant of sandy coasts and has larger spikelets and less hairy lemmae.—E. L. SWANN.

829/2a. LOLIUM TEMULENTUM L. var. **macrochaeton** A. Braun (1834: *Flora*, *17*, 252). This name is used by C. E. Hubbard in his determination of one of my plants collected as an adventive at Burton-on-Trent. By some writers it is regarded as the typical variety, and it is certainly the common one. In it the awn is straight and strong, longer than the glume.—J. E. LOUSLEY.

INTRODUCTION OF WEEDS IN CARROT SEED. Mr R. J. Libbey reports a number of aliens found in several localities in Norfolk, all growing in carrot crops. In one particular field he was able to obtain a sample of seed left over after drilling, and the weed seeds in this sample were of these aliens growing in that field. The alien weeds found thus, all but the first determined at Kew, are:—

Cuscuta campestris Yuncker (det. T. J. Yuncker), widespread in a field of carrots at Sprowston.

Solanum sp. (not yet determined).

Salsola Kali L. var. *Tragus* (L.).

Kochia scoparia (L.) Schrad.

Amaranthus retroflexus L.

Panicum capillare var. *occidentale* Rydb

Panicum Crus-galli L.

Setaria viridis (L.) Beauv.

Setaria glauca Beauv.

PLANT RECORDS.

To facilitate the corrections of their copies of *Comital Flora* by members, some changes in the use of * and [ ] have been adopted in this Report:—

* precedes the vice-county number whenever the species is either new to the vice-county or not recorded for that vice-county in the Society's annotated copy of the *Comital Flora*. [*] indicates a similar addition to be bracketed (a) when a native species is not native in the locality, and (b) on account of some doubt concerning the locality or the identification or the need or desire for confirmation. Introductions not bracketed in *C.F.* are left unbracketed. * or [*] precedes the *B.P.L.* number whenever the paragraph contains the sign before one of the records included, and *does not*, as was previously the case, *necessarily apply to the first record*. † indicates that the plant is not native in the locality: [†] indicates doubt concerning the nativity; preceding the *B.P.L.* number it applies to all records included in the paragraph, otherwise it precedes each record to which it applies.

Note.—If the record is a direct contribution, the name of the contributor is printed in small capitals. If the record is an Abstract, capitals are not used and the reference is given in parentheses, either in full or by a date referring to the Bibliography.

The response to the request for records to be sent in on 5 × 3 cards (cut-down postcards or any firm slips are adequate) has been extremely satisfactory and has been a great help. As the verbal explanation of the form required has not always been followed completely, one of the cards is this year set out alongside the instructions, showing the form most helpful. Room should be left at the top and left hand side of the card, and between the lines, for any editorial correction that may be necessary, as some cards were received so closely compressed at the top of the otherwise empty card that editing involved re-writing. But the lightening of work deserves the expression of thanks to all who have assisted, and perhaps the few who did not will now follow suit.

194/10m. ROSA DUMETORUM Thuill.	*B.P.L.* number and name.
Var. HEMITRICHA (Rip.) W.-Dod.	Variety if any.
35, Monm.; banks of R. Wye, between Hadnock Quarries and Symond's Yat, 1943, R. LEWIS, det. R. MELVILLE.	Vice-county number (comma), name (semicolon), locality etc., year, collector's name, sender's name if not collector, authority if not collector. Any additional notes to be inserted so that the whole makes a single sentence if possible.
3.9.1943. Herb. R. Lewis, No. 564. *13.6.1943. Herb. Brit. Mus.* *Passed by Mr Wade.*	

The notes printed in small italics to be added *in pencil*, as not to be printed: the full date in the left-hand bottom corner, the whereabouts of voucher specimens in the middle bottom (with reference numbers if any), and other comments or useful notes in the right-hand bottom corner or on the back of the card. When more than one record is given for the same vice-county the records are separated by *colons*. When the same person sends records following each other from more than one vice-county, the vice-counties are separated by *semicolons*.

N.B.—Do not use capitals (i.e. write, do not print) *unless you make absolutely sure from the printed Report* that you use them rightly—for the plant *name* but not for the authority, and for the names of the finder, recorder, and determiner when the record is a new one but not when it is taken from some publication. It is much more difficult to remove capitals wrongly used than to double-underline writing as instruction to the printer to use capitals: usually this could not be done and the card had to be re-written.

In dealing with records from parts of vice-counties which have been transferred from one county to another since H. C. Watson's time, the form " 20, [Beds.] " will be used, which indicates that the locality is now in Bedfordshire but belongs to vice-county 20 as it was in Hertfordshire *when the vice-county boundaries were fixed* by Watson.

When the record concerns an area dealt with by one of the standard County Floras, contributors, when they can, should indicate in ( ) the number or letter of the subdivision of the County used in the Flora: this not only is of help to the Editors but will be of assistance to future revisers of such Local Floras.

When, for some reason, the name following the vice-county number is not the name of the vice-county, as " 55, (Rutland)," the name is placed in ( ).

Several experiences this year lead me to reprint some of the instructions given by Mr P. M. Hall in the *1938 Report*, p, 21, where he writes:—

" All records should give the following data:—

(b) Locality and Watsonian vice-county (the county alone will not suffice).

(c) Date.

(d) Name of finder, if not the person submitting the record.

(e) If the plant belongs to a critical group, the name of the expert by whom it was determined: if the plant has not been named by an expert, a specimen must be sent for determination. Records in critical groups will not be published unless this procedure has been complied with.

(f) If material has been dried, the Herbarium in which it is kept, so that it may be traced if required for study." [Add this in pencil at the bottom of the card in the middle.]

" (g) Information as to the status of the plant (whether native, naturalised, or casual), habitat, altitude, soil, etc., is desirable." [This information may, if too long for printing, be added on the back of the card.]

"It is important that new vice-comital records should be supported by voucher material and members making such records are urged to deposit material in the herbarium of the Dept. of Botany, British Museum (Natural History), S. Kensington, or one of the other national or public herbaria."

The importance of depositing voucher specimens for all records of special interest, whether N.C.R. or not, cannot be overemphasised. It is more difficult to expunge a wrong record than to make a new one, and deletion can only be made satisfactorily by re-identification of a specified voucher. For instance, Arthur Bennett recorded *Salicornia disarticulata* Moss for " 44 Carm. Harmer, B.E.C. '12, 216 " (*Top. Bot., Suppl. 2,* 58). But the specimens in Herb. Arthur Bennett collected by Hamer are *not S. disarticulata.* I have seen specimens of *S. disarticulata* Moss from Carm. collected at Ferryside by my wife in 1932. But are they the real record for v.-c. 44? Did Hamer receive back and preserve other specimens which may be *S. disarticulata?* How can wrong records be deleted unless they are based on definitely specified voucher material? The British Museum endeavours to preserve voucher material for all published statements which require it; it is quite impossible to say now who may wish to re-examine the matter later.

Two bad mistakes at least have been avoided this year because the editor wished to satisfy himself that a record which appeared to him suspicious was in fact correct. But others which he had no reason to doubt may be wrong. In the last Report the record of *Salix arbuscula* from Rhum was placed in square brackets because the Editors thought it open to doubt and they were not given the opportunity of satisfying themselves concerning it. During Mr Hall's editorship the Editorial Sub-committee accepted his view that a record need not be accepted if no voucher was submitted for examination. Yet it is desirable to include in *Plant Records* all published N.C.R.s and records of outstanding interest. Only when the material of this and other similar records is made available for examination and comment will it be possible to remove the square brackets. (See *Vasc., 29,* 11). The aim of depositing vouchers is to make the material available for study by all who wish, which should be the desire of those who would aid the development of science.

Miss Rawlins's Irish records from H. 11-13 exposed the serious discrepancies between the *Comital Flora* (published in 1932) and the Census List given by Praeger in 1934 (*The Botanist in Ireland,* pp. 493-539). It was hoped to add to *Plant Records* the information necessary to correct *C.F.,* but three weeks' work showed this to be impossible without extensive investigation. As Dr Druce states (*C.F.,* pp. xxi-xxii) that the information in *C.F.* is taken from the Irish publications (*Cybele Hibernica, Irish Top. Bot.* and Supplements), the extent of the discrepancies is inexplicable. Dr Praeger writes:—Dr Druce " told me that he had no other sources of information—no store of unpublished records of his own. Shortly after the *Comital Flora* was published I checked it with *I.T.B.* and its *Suppls.* up to that date (1932). . . . I could not discover any discrepancy that was due to an error in *I.T.B.*, though there were some which had been corrected in the Supplements." Some errors in *C.F.* are obviously due to incorrect copying or bad handwriting, but having now made a complete list of the differences it is clear that a thorough examination of them all must be made. For the time being, therefore, I have used Praeger's Census List as a basis for Irish N.C.R.s and the printing of the necessary corrections to *C.F.* must be deferred.

*1/1. CLEMATIS VITALBA L. *H.11, Kilkny; hedges about Dysertmore, 1940-44, Miss E. RAWLINS, " not at all uncommon in the county." *H.13, Carlow; hedges about Borris, 1939-44, Miss E. RAWLINS.

*1/1b. CLEMATIS VITALBA L. var. INTEGRATA DC. 34, W. Glos.; English Bicknor, 1944, S. G. CHARLES, comm. W. R. PRICE. 41, Glam.; the form alluded to in Glamorgan Floras as " abundant " in the Vale of Glamorgan; the form with lobed leaflets was unknown in the county until found recently at Llandaff, Miss E. VACHELL. *47, Mont.; Caregliofa and Llandinam, J. A. Webb (Wade and Webb, 1943: 53)—brackets removed in annotated *C.F.*

2/2(2). THALICTRUM MONTANUM Wallr. 103, M. Ebudes; Coll; Tiree; Gunna; J. W. H. Harrison *et al.* (1941C: 277).

[*]†2/2(4). THALICTRUM COLLINUM Wallr. [*]47, Mont.; Tylwch; probably a garden escape, J. A. Webb (Wade and Webb, 1943: 54)—add to *C.F.* under *T. minus*—ED.

*2/2(6). THALICTRUM CAPILLARE Rchb. *104; N. Ebudes; Rhum, J. W. H. Harrison (1939E: 92)—add to *C.F.* under *T. majus* Cr.

3/2b. ANEMONE NEMOROSA L. var. PURPUREA DC. 35, Mon.; Priory Grove Wood, Monmouth, 1943, R. LEWIS.

3/2e. ANEMONE NEMOROSA L. var. APETALA E. J. Salisbury. 17, Surrey; near Ashtead, two colonies, 1944, W. H. SPREADBURY, comm. J. E. LOUSLEY.

†3/4. ANEMONE APENNINA L. 35, Mon.; hedgebank, St Mellons, 1943, W. LOVEGROVE, comm. NAT. MUS. WALES.

†3/8. ANEMONE JAPONICA S. & Z. 50, Denb.; roadside, Llangollen, and near Capel Garmon, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

4/1. Adonis annua L. em. Mill. 12, N. Hants.; cornfield, Bullington, 1944, Hon. E. Palmer, comm. Hon. W. J. L. Palmer. 14, E. Suss.; downs above Hastings, 1943, Miss Hanson and Miss Walsh (*Hastings Nat.*, *6*, 136).

6/3. Ranunculus acer L.—female form. 33, E. Glos.; meadow by Coombe Hill Canal, 4 miles S. of Tewkesbury, 1941, E. Nelmes.

6/6. Ranunculus lingua L. 17, Surrey; Wire Mill Pond, abundant, 1943, F. Rose—cf. *B.E.C. 1936 Rep.*, 236. 65, N.W. Yorks.; Ainderby Bottoms, 1943, C. M. Rob (*Nat.*, 1944: 18). 104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 93)—confirms doubtful record in *C.F.* —Ed.

6/10. Ranunculus sardous Cr. 6, N. Som.; field between Dunster and Minehead Warren, 1944, J. D. Grose.

*6/11. Ranunculus sceleratus L. *104, N. Ebudes; Canna, J. W. Harrison (1939E: 93).

6/13. Ranunculus parviflorus L. 12, N. Hants.; small but flourishing colony on chalky bank, The Common, Basingstoke, 1943, [G. W. Willis, who showed it to] N. E. G. Cruttwell. 16, W. Kent; Ryarsh Downs, increasing, 1944, F. Rose. 37, Worcs.; dry bank, Purshall Green, Chaddesley Corbett, 1943, R. C. L. Burges.

*6/20. Ranunculus fluitans Lam. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 277).

6/22. Ranunculus trichophyllus Chaix. 65, N.W. Yorks.; pond at Well, near Tanfield, 1944, E. C. Wallace.

6/22(2). Ranunculus radians Revel. 33, E. Glos.; near Staple Farm, Withington, 1942, H. K. Airy Shaw (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8, as *R. trichophyllus* var.).

6/22(2)b. Ranunculus radians Revel var. Godronii (Gren.) Revel. 33, E. Glos.; Withington Marsh. 1942, H. K. Airy Shaw (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8, as *R. trichophyllus* var.).

*6/24. Ranunculus heterophyllus Weber. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 277).

6/25d. Ranunculus peltatus Schrank var. floribundus (Bab.). 33, E. Glos.; pond by Andoversford Ry. Stn., 1942, H. K. Airy Shaw (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8).

*6/26. Ranunculus pseudo-fluitans (Syme) Baker & Foggitt. *35, Mon.; Hadnock Stream near Monmouth, S. G. Charles, comm. Nat. Mus. Wales. *47, Mont.; Newtown Weir, near Llanllwchaiarn Footbridge and near Llandysilio, J. A. Webb (Wade and Webb, 1943: 54).

6/26b. RANUNCULUS PSEUDO-FLUITANS Baker & Foggitt var. MINOR Pearsall. 33, E. Glos.; Lower Hilcot, Colesbourne and Ampney St Peter, 1942, H. K. Airy Shaw (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 9).

6/28b. RANUNCULUS BAUDOTII Godr. var. CONFUSUS (Godr.). 34, W. Glos.; Frampton, R. B. Abell, 1942 (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8).

6/31. RANUNCULUS LENORMANDI F. Schultz. 64, M.W. Yorks.; spring on moor towards Greenhow, Pateley Bridge, 1943, E. C. WALLACE, (see *Nat.*, 1944: 18).

*7/2. CALTHA RADICANS T. F. Forst. *41, Glam.; St Brides-super-Ely, 1943: St Fagans, 1944; " examined by A. J. WILMOTT, who offers no objection to the identification, the plants rooting at the nodes fairly freely at both places," E. VACHELL. *110, O. Hebr.; Barra, A. J. Wilmott (1939: *J.B.*, 189): Vatersay and S. Uist, J. W. H. Harrison (1941B: 231)—add to *C.F.*

9/2. HELLEBORUS FOETIDUS L. 15, E. Kent; 16 colonies between Bluebell Hill and Boxley: †by roadside S. of Headcorn; a green flowered broad leaved form commoner in the more open parts, and one with narrow leaflets and prominent dark red tips to the sepals commoner in the more wooded parts, i.e. Boxley Warren, both 1944, F. ROSE.

10/1. ERANTHIS HYEMALIS Salisb. 47, Mont.; Llanllugan, J. A. Webb (Wade and Webb, 1943: 54).

*11/1. AQUILEGIA VULGARIS L. *47, Mont.; Churchstoke, Montgomery, Dolfor, Llandinam and Llanmerewig, J. A. Webb (Wade and Webb, 1943: 54). *63, S.W. Yorks.; Hawk's Wood, Kiveton Park, 1943, Mr Dovaston (J. Brown, 1944: *N.W. Nat.*, *18*, 325).

†12/1. NIGELLA DAMASCENA L. 47, Mont.; Llangurig, J. A. Webb (Wade and Webb, 1943: 54).

*†13/3. DELPHINIUM GAYANUM Wilmott. 14, E. Suss.; Newhaven, 1939, L. A. W. BURDER (as *D. Ajacis* L.). 21, Middx.; on a bombed site, Lupus St., London, S.W.1, 1943, D. MCCLINTOCK (as *D. Ajacis*). *35, Mon.; orchard, Marshfield, 1933, Mr WOODCOCK, comm. NAT. MUS. WALES—add to *C.F.* in brackets.

14/1. ACONITUM ANGLICUM Stapf. 2, E. Cornwall; Coombe Valley, 1942, J. E. DAVIE, comm. NAT. MUS. WALES (confirmation for the county).

17/1. BERBERIS VULGARIS L. 17, Surrey; top of railway embankment, Banstead Downs, 1943, J. R. WALLIS. 22, Berks.; Sulham, 1944, D. McCLINTOCK.

†17/2. BERBERIS AQUIFOLIUM Pursh. 35, Monm.; edge of Garth Wood, near Monmouth, 1944, R. LEWIS. 47, Mont.; Carno, above Newtown, Churchstoke, Garthmyl, and Penstrowed, J. A. Webb (Wade and Webb, 1943: 54).

†21/1. PAPAVER SOMNIFERUM L. 44, Carm.; amongst potatoes, near Mynydd y Gareg, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; Newtown, Dolforwyn and Llanfair Caereionion, J. A. Webb (Wade and Webb, 1943: 54).

*21/2. PAPAVER RHOEAS L. *104, N. Ebudes; Muck, J. W. H. Harrison (1939E: 93).

21/2b. PAPAVER RHOEAS L. var. STRIGOSUM (Boenn.). 63, S.W. Yorks.; field near Thorpe Salvin, 1943, J. Brown (1944: *N.W. Nat.*, *18*, 325).

†23/2. GLAUCIUM CORNICULATUM (L.) Curt. 33, E. Glos.; Fiddington, Tewkesbury, 1944, C. W. BANNISTER, comm. W. R. PRICE.

†31/4. CORYDALIS LUTEA (L.) DC. 14, E. Sussex; on the Downs near Wilmington, 1943, H. PEATFIELD, comm. A. J. WILMOTT. 47, Mont.; Llanfair Caereinion, Kerry, Newtown, Dolanog, and Pontdolgoch, J. A. Webb (Wade and Webb, 1943: 54).

*32/1. FUMARIA CAPREOLATA L. *39, Staffs.; roadside hedges near Ellenhall, 1944, E. S. EDEES, confirmed by F. RILSTONE. *104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 93).

*32/4. FUMARIA PURPUREA Pugsl. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 278).

*32/5. FUMARIA BORAEI Jord. 15, E. Kent; near Chart: near Headcorn; both 1944, F. ROSE. 16, W. Kent; E. Malling village: Warren Wood, E. Malling: near Kippings Cross: all 1944, F. ROSE. 34, W. Glos.; English Bicknor, S. G. CHARLES, comm. W. R. PRICE. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 278). *110, O. Hebr.; Vatersay, Barra, and Benbecula, J. W. H. Harrison (1941B: 232).

32/5×10. FUMARIA BORAEI Jord. × OFFICINALIS L. 4, N. Devon; cultivated land near Cove, Tiverton, 1943, A. L. STILL—det. H. W. Pugsley, who states he would rather not call it ×*F. Painteri* as that plant set some good fruit, and the present plant is quite barren.

*32/9. FUMARIA BASTARDI Bor. *104, N. Ebudes; Eigg and Muck, J. W. H. Harrison (1939E: 93).

*32/11. Fumaria micrantha Lag. 17, Surrey; Fetcham Downs, 1941, J. E. Lousley, teste Pugsley: Chipstead Valley, 1943, J. E. Lousley, A. B. Jackson and N. Y. Sandwith: Warren Barn, Warlingham, 1943, J. E. Lousley. *76, Renfrew; allotments at Merrylee, Glasgow, July 1942, R. Mackechnie.

*32/13. Fumaria parviflora Lam. *61, S.E. Yorks.; cornfield, Staxton near Scarborough, *Yorks. Nat. Union* Excursion, (*Nat.*, 1943: 118; 1944: 18).

†34/1. Cheiranthus Cheiri L. H.12, Wexford; on old walls, New Ross, 1940-44, Miss E. Rawlins.

*35/2. Rorippa sylvestris (L.) Bess. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 93, as *Nasturtium sylvestre* DC.).

35/4. Rorippa islandica (Cr.) Bess. 21, Middx.; on a bombed site, Causton Street, London, S.W.1, 1943, D. McClintock (as *Nasturtium palustre*).

†36/2. Barbarea verna (L.) Asch. 30, Beds.; Round Green, Luton, 1939, J. G. Dony, det. A. B. Jackson.

36/5. Barbarea intermedia Bor. 3, S. Devon; Goodrington, Paignton, 1943, F. M. Day. 37, Worcs.; Wharf Hotel, Holt, 1943, F. M. Day.

37/6. Arabis glabra (L.) Bernh. 28, W. Norf.; a few plants on Barnham Cross Common, 1944, J. A. Whellan.

†37/12. Arabis caucasica Willd. 47, Mont.; naturalised on walls, Montgomery, Kerry and near Dolwen, J. A. Webb (Wade and Webb, 1943: 55).

39/1c. Cardamine pratensis L. var. dentata (Schultes). 41, Glam.; St Fagans, 1942, a scarce form in the vice-county except as a garden weed, E. Vachell.

39/7. Cardamine bulbifera (L.) Crantz. 14, E. Suss.; about Hastings, 1943, (*Hastings Nat.*, *6*, 136): wood between Mountfield and Robertsbridge, 1944, Miss Hanson (*Hastings Nat.*, *6*, 151).

†41/1. Aubretia deltoidea DC. 47, Mont.; naturalised on walls and on stony hedges near Llanfair Caereionion, J. A. Webb (Wade and Webb, 1943: 55).

†42/6. Alyssum Alyssoides (L.) L. 30, Beds.; railway bank, Flitwick, 1942, G. D. Nicholls, comm. J. G. Dony.

†42/9. Alyssum incanum L. 35, Mon.; garden weed, New Tredegar, 1933, J. W. Thomas, comm. Nat. Mus. Wales.

43/4. DRABA MURALIS L. 4, N. Devon; Ilfracombe, M. G. Palmer (*Trans. Devon Ass. Adv. Sci.*, *75*, 57: 1943). †48, Mer.; bridge at Llandderfel, casual, 1939, J. A. WHELLAN.

*44/2f. EROPHILA BOERHAAVII (Van Hall) Dum. var. BRACHYCARPA (Jord.) O. E. Schultz. *103, M. Ebudes; Coll, J. W. H. Harrison *et. al.* (1941C: 278). *110, O. Hebr.; N. Uist, J. W. H. Harrison (1941B: 232)—also collected in 1939 by Miss M. S. CAMPBELL on wall top at Rodel, S. Harris, and Traigh Mhor, North Tolsta, Lewis—A. J. WILMOTT.

*44/3. EROPHILA PRAECOX (Stev.) DC. *110, O. Hebr.; Balesharc, J. W. H. Harrison (1941B: 232).

*45/7. COCHLEARIA DANICA L. *104, N. Ebudes; Muck; Eilean nan Each: Hyskeir; Eigg: J. W. H. Harrison (1939E: 94).

†47/2. HESPERIS MATRONALIS L. 21, Middx.; site of St Olave's, Silver St., London, E.C.2, 1944, D. MCCLINTOCK. 22, Berks.; Easthampstead Park, 1944, D. MCCLINTOCK. 35, Mon.; banks of R. Wye, far from any garden, between Haduock Quarries and Symond's Yat, 1943, R. LEWIS. 47, Mont.; Llandysilio, Golfa, Meifod, Llanllugan, Llandrinis and Snead, J. A. Webb (Wade and Webb, 1943: 55).

†49/3. SISYMBRIUM ALTISSIMUM L. 3, S. Devon; air-raid debris, Plymouth, 1943, erroneously recorded in local press as *S. Irio* L., E. M. PHILLIPS. 21, Middx.; waste land, junction of Hartington Road and Chertsey Road, Chiswick, 1944, D. H. KENT. H.11, Kilkny; casual on railway line near New Ross, 1940-42, Miss E. RAWLINS. H.13, Carlow; Borris railway line, 1940-44, Miss E. RAWLINS.

†49/4. SISYMBRIUM ORIENTALE L. 3, S. Devon; air-raid debris. Plymouth, 1943; Pomphlett and Oreston, Plymstock, 1943: E. M. PHILLIPS. 8, S. Wilts.; Larkhill, 1942, D. MCCLINTOCK. 14, E. Suss.; Preston Park, Brighton, 1944, L. A. W. BURDER. 21, Middx.; bombed site, Northolt Road, South Harrow, and bombed site. Uxbridge Road. West Ealing, 1944. D. H. KENT. 47, Mont.; Montgomery, Welshpool, Buttington, Four Crosses to Arddleen and Llanbrynmair, J. A. Webb (Wade and Webb, 1943: 55). 54, N. Lincs.; Skegness, 1943, D. MCCLINTOCK. H.13, Carlow; Borris railway line, Miss E. RAWLINS.

49/6b. SISYMBRIUM OFFICINALE (L.) Scop. var. LEIOCARPUM DC. 56, Notts.; near Mattersey, 1943, John Brown (1944: *N.W. Nat.*, *18*, 325).

*49/7. SISYMBRIUM THALIANUM (L.) Gay. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 278).

49/8. SISYMBRIUM ALLIARIA Scop. H.12, Wexford; Newtownbarry, 1943, Miss E. BOOTH, comm. Miss E. RAWLINS.

*50/1. Erysimum cheiranthoides L. *H.12, Wexford; garden weed, Ballinastraw, 1942, Miss E. Booth, comm. Miss E. Rawlins. *H.13, Carlow; garden weed, Carrigduff, near Newtownbarry, 1942, Miss E. Rawlins.

*†54/6. Brassica Cheiranthos Vill. *44, Carm.; Llanelly, 1944, J. A. Webb, comm. Nat. Mus. Wales.

*†54/22. Brassica incana (L.) F. Schultz. *35, Mon.; Newport docks, 1942, J. Macqueen: Rumney, 1944, A. E. Wade, comm. Nat. Mus. Wales.

*55/1. Diplotaxis tenuifolia (L.) DC. *7, N. Wilts.; Rodbourne, Swindon, 1944, N. Peskett, comm. J. D. Grose, det. E. C. Wallace.

*55/2. Diplotaxis muralis (L.) DC. 3, S. Devon; air-raid debris, Plymouth, 1943, E. M. Phillips. *47, Mont.; near Berriew, near Cemmaes, near Derwenlas and Newtown, J. A. Webb (Wade and Webb, 1943: 55).

*60/1. Coronopus didymus (L.) Sm. *26, E. Suff.; East Ness, Lowestoft, 1925, O. A. Reade, comm. A. J. Wilmott.

*60/2. Coronopus procumbens Gilib. 63, S.W. Yorks.; farmyard, Hatfield High Levels, 1943, Dr S. P. Rowlands and Dr J. M. Taylor (*Nat.*, 1944: 18). *110, O. Hebr.; Barra, J. W. H. Harrison (1941B: 233).

*†61/2. Lepidium latifolium L. 33, E. Glos.; Severn bank (left), weir just below Gloucester, 1944, not far from its native locality at Westbury, J. W. Haines. *35, Mon.; Alexandra Dock, Newport, 1942, John Macqueen, comm. Nat. Mus. Wales.

*†61/3. Lepidium Draba L. *6, N. Som.; Minehead Warren, 1944, J. D. Grose. 45, Pemb.; abundant near the salt marshes, Tenby, 1944, Mrs F. L. Rees, comm. Nat. Mus. Wales. *47, Mont.; Montgomery, J. A. Webb (Wade and Webb, 1943: 55).

61/4. Lepidium ruderale L. 33, E. Glos.; near Waterworks, Tewkesbury, 1943, F. M. Day.

†61/12. Lepidium sativum L. 47, Mont.; many plants among swedes, between Llwyn Cowrid and Sarn, J. A. Webb (Wade and Webb, 1943: 55).

†61/24. Lepidium neglectum Thell. 35, Mon.; Dixton, Redbrook and Kymin Hill, S. G. Charles, comm. Nat. Mus. Wales.

*64/1. Thlaspi arvense L. 6, N. Som.; Greenaleigh: Allerford: both 1944, J. D. Grose. *47, Mont.; Llanllwchaiarn and Llanfyllin Station, J. A. Webb (Wade and Webb, 1943: 55).

[*]65/1. IBERIS AMARA L. 17, Surrey; in such abundance on slopes above Headley Lane in 1943 that the white patches of flowering plants were conspicuous from the opposite slopes of Box Hill (cf. *J.B.*, *74*, 197, 1936), J. E. LOUSLEY. [*]66, Durham; oatfield weed, near Vigo, not far from Birtley (1944: *Vasc.*, *29*, 24).

66/1. TEESDALIA NUDICAULIS (L.) R. Br. 62, N.E. Yorks.; sandy bank in lane, Youlton Moor, Aldwark, 1944, E. C. WALLACE.

*†68/1. ISATIS TINCTORIA L. *19, N. Essex; one large plant on waste ground, W. Mersea, 1944, J. A. WHELLAN. Not given for 18 or 19 in *C.F.*, but Gibson (1862: *Fl. Essex*, 35) gives a locality in 19 and also " near Epping, seen growing year after year in the same place, J.R."=John Ray—Add 19 to *C.F.*—ED.

†74/2. BUNIAS ORIENTALIS L. 30, Beds.; Chalton Cross, Toddington; V. H. CHAMBERS, comm. J. G. DONY.

75/1. CRAMBE MARITIMA L. 15, E. Kent; Seasalter beach, 1944, F. ROSE and C. WEST.

*77/1. CAKILE MARITIMA Scop. *47, Mont.; by the Llyfnant Brook, Dovey Estuary, J. A. Webb (Wade and Webb, 1943: 55).

80/1b. RAPHANUS RAPHANISTRUM L. var. FLAVUS Druce. 41, Glam.; in very great abundance for two years in cornfields, St Fagans, 1943, 1944—flowers yellow mostly with dark veins, E. VACHELL.

†80/4. RAPHANUS SATIVUS L. 47, Mont.; adventive in a field between Sarn and Llwyn Cowrid, J. A. Webb (Wade and Webb, 1943: 55).

*87/1. HELIANTHEMUM GUTTATUM (L.) Mill. *49, Carn.; mainland opposite Bardsea I. (1938, W. Hughes-D'Aeth), 1939 (and det.) Miss B. M. MORGAN, awaiting further material to determine whether it is the var. *Breweri* Planch. or not, the available specimens being small, unbranched and nearly ebracteate.

88/1. VIOLA STAGNINA Kit. sec. Rchb. 63, S.W. Yorks.; within ten miles of Thorne Waste, J. M. Taylor, S. P. Rowlands and A. A. Dallman (1942: *N.W. Nat.*, *17*, 255-256).

88/4c. VIOLA RIVINIANA Rchb. forma MINOR Murbeck. 36, Heref.; near Purlieu Lane, Mathon: Evendine, Colwall; both 1943, F. M. DAY.

88/6. VIOLA CANINA L. 64, M.W. Yorks.; Walkingham Hill, near Farnham, 1943, E. C. Wallace (*Nat.*, 1944: 18).

88/6b. VIOLA CANINA L. var. ERICETORUM (Hayne) Rchb. 14, E. Suss.; in small quantity at Eridge Park, 1943, J. R. WALLIS. 20, Herts.; Croxley Moor, and Moor Park, Rickmansworth, 1943, F. M. DAY.

*88/7. VIOLA LACTEA Sm. *35, Mon.; rough field by Minnetts Lane, near Roggiett, 1944, Mrs J. C. ELLIS, comm. NAT. MUS. WALES (see *Nat. Mus. Wales 37th Ann. Rep.*, 11: 1944). 41, Glam.; ridge behind Porthcawl, 1941, E. M. THOMAS, det. E. VACHELL.

88/8b. VIOLA ODORATA L. var. IMBERBIS (Leight.) Hensl. 34, W. Glos.; Dymock, 1943, F. M. DAY.

88/8d. VIOLA ODORATA L. var. DUMETORUM (Jord.) R. & F. 34, W. Glos.; Ryton, Bromsberrow; 36, Heref.; Chance's Pitch, Colwall: both 1943; at both places the flowers, as in var. *imberbis* (Leight.), are without hairs on the lateral petals, and round Bromsberrow it appears to be the general form: F. M. DAY.

88/8h. VIOLA ODORATA L. var. SUBCARNEA (Jord.) Parl. 36, Heref.; Chance's Pitch, Colwall, 1943, the flowers, as in var. *imberbis* (Leight.), are without hairs on the lateral petals, F. M. DAY.

88/9×8. VIOLA HIRTA L. × ODORATA L. 65, N.W. Yorks.; Nosterfield lime quarry, 1944, E. C. WALLACE.

88/9i. VIOLA HIRTA L. var. PROPERA (Jord.) Gillot. 36, Heref.; Holt Coppice, Eastnor; 1943: plentiful on the dry silurian limestone banks in Colwall district, near the Malvern Hills, especially where the soil is shallow, but hardly occurring on deeper soils and not at all on the shallow soil of the Malvern Granite, F. M. DAY.

*88/20. VIOLA LLOYDII Jord. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 279). *104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 95).

*88/22. VIOLA AGRESTIS Jord. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 279).

*88/23. VIOLA SEGETALIS Jord. *47, Mont.; Llanllwchaiarn, J. A. Webb (Wade and Webb, 1943: 55). *110, O. Hebr.; S. Uist and Benbecula, J. W. H. Harrison (1941B: 233, as *V. agrestis* var.).

*88/24. VIOLA OBTUSIFOLIA Jord. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 279).

*88/26. VIOLA RURALIS Bor. *104, N. Ebudes; Muck, J. W. H. Harrison (1939E: 95).

88/33. VIOLA LUTEA Huds. 47, Mont.; purple flowered on Kerry Hills near Devil's Elbow, and Dolfor, J. A. Webb (Wade and Webb, 1943: 56, as var. *amoena* Hensl.).

*88/34. VIOLA CURTISII Forster. *104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 95).

*89/1. Polygala serpyllifolia Hose. *47, Mont.; near Dolfor, etc., J. A. Webb (Wade and Webb, 1943: 56).

*89/4. Polygala oxyptera Rchb. 30, Beds.; old chalk working near Maiden's Bower, Totternhoe and near Blow's Downs, Dunstable, 1944, J. E. Lousley and E. Milne-Redhead. *103, M. Ebudes; Coll and Gunna, J. W. H. Harrison *et al.* 1941C: 279, as *P. dubia* Bellynck).

[*]92/2. Dianthus deltoides L. [*]†47, Mont.; sparingly as a garden escape about Bont Dolgadfan and Llanbrynmair, J. A. Webb (Wade and Webb, 1943: 56). [*]H.13, Carlow; Bruno, on grassy mound near R. Slaney, 1941-44, Miss E. Booth, comm. Miss E. Rawlins, "no houses or gardens near, quite an established little colony."

†92/5. Dianthus barbatus L. 44, Carm.; lineside, Hendy, 1944, J. A. Webb, comm. Nat. Mus. Wales.

†96/5. Silene anglica L. 34, W. Glos.; cornfield, Avening, 1943, J. W. Haines.

[*]†96/10b. Silene nutans L. var. Smithiana Moss. [*]35, Mon.; Newport Docks, 1944, John Macqueen, comm. Nat. Mus. Wales.

96/16. Silene dichotoma Ehrh. 35, Mon.; field on Kymin Hill, Monmouth, c. 1929, S. G. Charles, comm. Nat. Mus. Wales.

*98/7. Lychnis Viscaria L. *79, Selk.; reported from "a rock face near the Corbie Lynn waterfall, about two miles from Selkirk town," by Miss A. Chisam, 1944, comm. A. J. Wilmott.

*98/8. Lychnis alpina L. *104, N. Ebudes; N. side of Fionchra, Rhum, Harrison *et al.* (1944: 113).

*100/2. Cerastium arvense L. 33, E. Glos.; roadside between Daglingworth and Ermin Street, 1944, E. Nelmes. *47, Mont.; Caersws, Pontdolgoch and from Carno to Talerddig, J. A. Webb (Wade and Webb, 1943: 56).

*100/4. Cerastium arcticum Lange. 98, Argyll M.; northern slopes of Beinn Dothaidh, 1943, E. C. Wallace. *110, O. Hebr.; "very rare on a cliff ledge on Rueval, Benbecula," J. W. H. Harrison (1941B: 234).

*100/8. Cerastium semidecandrum L. *104, N. Ebudes; Rhum and Sanday, J. W. H. Harrison (1939E: 96). *110, O. Hebr.; Baleshare, J. W. H. Harrison (1941B: 234).

*100/9. Cerastium tetrandrum Curt. *39, Staffs.; Rushton; on the platform of Cliffe Park station, 1941, E. S. Edees (in *Trans. N. Staffs. Field Club*, 1941-42).

*101/1. Stellaria aquatica (L.) Scop. 21, Middx.; muddy places by the Grand Union Canal at Hanwell, 1944, D. H. Kent. *47, Mont.; by the Severn near Forden Bridge and near Leighton, J. A. Webb (Wade and Webb, 1943: 56).

101/2. Stellaria nemorum L. 39, Staffs.; Ravens Clough near Rushton, 1943, E. S. Edees.

101/3b. Stellaria media (L.) Vill. var. glabella (Jord. & Fourr.) Rouy & Fouc. 56, Notts.; sandy ground near Mattersey, 1943, John Brown (1944: *N.W. Nat.*, *18*, 325, as *S. pallida* (Dum.) Piré).

*101/4. Stellaria neglecta Weihe. 17, Surrey; very local in a ravine of Wimbledon Common, 1943, J. E. Lousley. 41, Glam.; Fairwater, E. Vachell (*Trans. Cardiff N.S.*, *71*, 30). *104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 96).

101/4b. Stellaria neglecta Weihe var. Elizabethae (F. Schultz). 41, Glam.; Oxwich, E. Vachell (*Trans. Cardiff N.S.*, *71*, 30).

101/5. Stellaria Holostea L. 98, Argyll M.; grassy slope below rocks on Ben Dothaidh, alt. 3000′, not flowering, 1943, E. C. Wallace.

[*]102/6. Arenaria leptoclados Guss. 36, Heref.; top of Bradlow Knoll, near Ledbury, 1944, A. J. Wilmott. *47, Mont.; Llanllwchaiarn, Pontdolgoch, Clatter and Llanidloes, J. A. Webb (Wade and Webb, 1943: 56).

*102/7. Arenaria peploides L. *47, Mont.; in small quantity on shingle near Dovey Junction, J. A. Webb (Wade and Webb, 1943: 56).

[*]102/8. Arenaria tenuifolia L. 8, S. Wilts.; Larkhill, 1943, in one or two spots, D. McClintock. [*]†35, Mon.; on railway ballast, Hadnock, 1944, S. G. Charles, comm. Nat. Mus. Wales (see *Nat. Mus. Wales 37th Ann. Rep.*, 11: 1944).

102/12. Arenaria sedoides (L.) Druce. 98, Argyll M.; summit of Beinn Achaladoir, 1943, E. C. Wallace.

102/14. Arenaria balearica L. 70, Cumb.; forming flat cushions on the red-sandstone walls about St Bees, 1943, C. D. Pigott, comm. A. J. Wilmott.

103/7. Sagina ciliata Fr. 34, W. Glos.; churchyard, Minchinhampton, 1941, a first record for Flora district 6. Still there in 1942 and 1943, G. C. Pownall.

*103/8. Sagina apetala Ard. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 96).

*103/10. SAGINA MARITIMA G. Don. *104, N. Ebudes; Eilean nan Each, J. W. H. Harrison (1939E: 96).

103/11c. SAGINA PROCUMBENS L. var. DAVIESII Druce. 7, N. Wilts.; wall, Marlborough College, 1943 (*Rep. Marlb. Coll. N.H.S., No. 92* (1944), 11, "a curious doubled specimen probably this variety"); "it is barren, and can only spread by vegetative means" (J. D. Grose; 1944: 347).

*104/2. SPERGULA SATIVA Boenn. 14, E. Suss.; in a sand bunker on the Nevill Golf Course near Tunbridge Wells, 1943, J. R. WALLIS. *47, Mont.; near Ffrwd Mawr, J. A. Webb (Wade and Webb, 1943: 56).

*105/3. SPERGULARIA SALINA Presl. *47, Mont.; scarce on the saltings near Dovey Junction, J. A. Webb (Wade and Webb, 1943: 56).

*105/5. SPERGULARIA RUBRA (L.) J. & C. Presl. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 280, as *S. campestris* (All.) Asch.).

*106/1. POLYCARPON TETRAPHYLLUM L. *104, N. Ebudes; "a single plant in a rock crevice along the Kinloch Burn, Rhum," J. W. H. Harrison (1939E: 96).

[*]108/2. CLAYTONIA PERFOLIATA Donn. 22, Berks.; two or three plants at Sunninghill Park, 1944, D. MCCLINTOCK. [*]H.13, Carlow; Borris, 1940-44, abundant in a Rhododendron bed, probably introduced with the Rhododendrons from Bagshot, Miss E. RAWLINS.

*109/1. MONTIA FONTANA L. *45, Pemb.; Caniston Woods, near Haverfordwest, 1944, Mrs F. L. REES, comm. NAT. MUS. WALES.

111/2. ELATINE HEXANDRA DC. 49, Carn.; abundantly in Llyn Glasfryn, 1942, and Ystumllyn, near Criccieth, 1943, J. A. WHELLAN.

†112/5. HYPERICUM CALYCINUM L. 47, Mont.; Fron, Derwenlas and Llandinam, J. A. Webb (Wade and Webb, 1943: 56).

112/12. HYPERICUM DUBIUM Leers. 30, Beds.; Byslip Wood, Studham, 1943, J. G. DONY.

*112/14. HYPERICUM PERFORATUM L. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 97).

†113/2. MALOPE TRIFIDA Cav. 33, E. Glos.; in field of kale, Fiddington, Tewkesbury, 1944, C. W. BANNISTER, comm. W. R. PRICE, det. at Kew.

†116/2. LAVATERA SYLVESTRIS Brot. 45, Pemb.; cliffs at Tenby, 1941, thoroughly naturalised, E. VACHELL.

117/1b. MALVA MOSCHATA L. var. HETEROPHYLLA Lej. & Court. 34, W. Glos.; English Bicknor, 1944, S. G. CHARLES, comm. W. R. PRICE.

*117/3. MALVA NEGLECTA Wallr. *H.13, Carlow; quai R. Barrow at St Mullins, 1940-1943, Miss E. RAWLINS (as *M. rotundifolia* L.).

*123/1. TILIA PLATYPHYLLOS Scop. 36, Heref.; a fine tree on the edge of Frith Wood near Ledbury, 1944, A. J. WILMOTT. *47, Mont.; steep banks of the Severn at Milford, probably native, and near Llandyssil and Brynmeurig, probably planted, J. A. Webb (Wade and Webb, 1943: 56). †64, M.W. Yorks.; ravine, Hackfall near Masham, 1944, looking native, but probably planted, E. C WALLACE.

*123/3. TILIA CORDATA Mill. 34, W. Glos.; Collinspark Wood, Upleadon, 1943, F. M. DAY. 36, Heref.; a fine tree in Frith Wood near Ledbury, 1944, A. J. WILMOTT. *47, Mont.; common in the west both as a native and as a planted tree, J. A. Webb (Wade and Webb, 1943: 56). 64, M.W. Yorks.; ravine, Hackfall, 1944; 65, N.W. Yorks.; Magdalen Banks, opposite Hackfall on rocky cliff above river Ure, 1944, E. C. WALLACE.

†125/4. LINUM USITATISSIMUM L. 3, S. Devon; Paignton, 1941, S. C. Patterson (*Trans. Devon. Ass. Adv. Sci.*, *75*, 61: 1943). 47, Mont.; garden weed at Newtown, J. A. Webb (Wade and Webb, 1943: 57). 54, N. Lincs.; casual at Gt. Steeping, 1943, D. MCCLINTOCK.

†127/2. GERANIUM VERSICOLOR L. 16, W. Kent; roadside grass verge at West Wickham, 1944, F. R. BROWNING (as *G. striatum* L.).

*127/4. GERANIUM PRATENSE L. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 97).

†127/5. GERANIUM PHAEUM L. 43, Radn.; naturalised fairly plentifully in hedge near Old Radnor, 1943, J. A. WHELLAN. 47, Mont.; hedgebank near the church, Forden, 1943, J. BEDFORD, comm. A. J. WILMOTT.

*127/7. GERANIUM PYRENAICUM Burm. f. 8, S. Wilts ; Larkhill, 1943, probably only casual here, D. MCCLINTOCK. *47, Mont.; Newtown and Breidden, J. A. Webb (Wade and Webb, 1943: 57).

*127/8. GERANIUM COLUMBINUM L. *47, Mont.; Aberbechan, Cemmaes and Dovey Junction, J. A. Webb (Wade and Webb, 1943: 57).

127/10b. GERANIUM MOLLE L. var. AEQUALE Bab. 47, Mont.; Newtown and near Brynderwen, J. A. Webb (Wade and Webb, 1943: 57).

*127/11. GERANIUM ROTUNDIFOLIUM L. 16, W. Kent; Upper Halling, on gravel by chalk pit, abundant, 1943, F. ROSE. *H.11, Kilkny.; near old kiln, on banks of R. Nore at Russelstown above New Ross, 1941-44, Miss E. RAWLINS, det. R. LL. PRAEGER.

*127/12. Geranium pusillum L. *110, O. Hebr.; S. Uist, J. W. H. Harrison (1941B: 236). *H.13, Carlow; waste ground, roadside, Ballyellen (near Gore's bridge), 1944, Miss E. Rawlins, seen by R. Ll. Praeger.

*127/13. Geranium lucidum L. *H.13; Carlow; walls and roadside in village of Borris, 1939-44, Miss E. Rawlins.

127/14. Geranium Robertianum L.—with white flowers. 3, S. Devon; Whympston, Modbury, 1943, E. M. Phillips.

127/15. Geranium purpureum Vill. emend. 2, E. Cornw.; abundant in two places (with *G. Robertianum* L.) in hedges near Polzeath, 1943, Miss C. Longfield.

†127/16. Geranium macrorrhizum L. 3, S. Devon; "in great abundance on North Hill, Withycombe, called by the common people, 'Valey Ann'," Rev. W. A. Neck (*Trans. Devon Ass. Adv. Sci.*, *75*, 60: 1943).

†127/19. Geranium nodosum L. 34, W. Glos.; Upper Redbrook, 1944, S. G. Charles, comm. W. R. Price.

†127/24. Geranium ibericum Cav. 35, Mon.; near the school, Cwmyoy, 1942, S. G. Charles, comm. Nat. Mus. Wales.

†130/2. Tropaeolum majus L. 47, Mont.; alien, Newtown, J. A. Webb (Wade and Webb, 1943: 57).

132/1b. Oxalis Acetosella L. var. subpurpurascens DC. 36, Heref.; near Snodhill, not very far from the Radnor border, Dr Gray, of Dorstone, "the purple variety," new to v.-c. 40 (*Trans. Woolhope Nat. F.C. for 1933-35*, 163: 1935)—[Wi.].

*†132/2. Oxalis corniculata L. *35, Mon.; Hadnock Road, Monmouth, 1942, S. G. Charles, comm. Nat. Mus. Wales. *47, Mont.; Llanfair Caereinion and Four Crosses, J. A. Webb (Wade and Webb, 1943: 57).

†133/2. Impatiens biflora Walt. 12, N. Hants.; by the R. Enborne near Newbury, 1944, H. Wheeler (as *I. fulva*), comm. A. J. Wilmott.

†133/3. Impatiens parviflora DC. 21, Middx.; waste land by the river at Chiswick, 1944, D. H. Kent.

*†133/4. Impatiens Roylei Walp. 44, Carm.; near Llandyrri, 1943, J. F. Jones, comm. Nat. Mus. Wales. *47, Mont.; near Meifod and abundant by the Tanat at Penybont Fawr, J. A. Webb (Wade and Webb, 1943: 57). *106, E. Ross; seen escaped just E. of the station at Evanton, 1943, A. J. Wilmott. *H.11, Kilkny.; river banks Nore Woodstock demesne 1940-44, Miss E. Rawlins. *H.13, Carlow; banks of small stream near Borris, 1942, Miss E. Rawlins.

136/1b. Ilex Aquifolium L. var. laurifolium Lej. 47, Mont.; Cefn-bryn-talc, near Llandyssil, Tref Caereinion and Berriew, J. A. Webb (Wade and Webb, 1943: 57).

†137/3. **Evonymus japonicus** L. 44, Carm.; tip between Stradey and Sandy, 1944, J. A. Webb, comm. Nat. Mus. Wales.

138/1. Rhamnus Frangula L. 16, W. Kent; in flower and fruit on the same branches, Hook Green, near Lamberhurst, 21.8.1943, J. E. Lousley and J. R. Wallis.

†138/3. Rhamnus Alaternus L. 41, Glam.; scree at the foot of Penarth Head, 1943, A. E. Wade.

†140/3. Vitis Thunbergii (S. & Z.) Druce. 47, Mont.; abundant on the Severn banks at Newtown and on tips at Caersws, J. A. Webb (Wade and Webb, 1943: 57).

142/2. Acer campestre L. H.12, Wexford; woods and hedges near Pilltown in Barrow Estuary, 1942-44, Miss E. Rawlins.

†142/3. Acer platanoides L. 47, Mont.; common as a planted tree in the Llangwnog area, seedlings at Bont Dolgadfan, J. A. Webb (Wade and Webb, 1943: 57).

*147/1b. Genista anglica L. var. subinermis Rouy & Fouc. *98, Argyll M.; moorland beside Loch Ba, Rannoch Moor, 1943, E. C. Wallace.

147/2. Genista pilosa L. 14, E. Suss.; above Newbridge, about a dozen bushes: above Chuck Hatch, only one plant: by Gill's Lap Quarry: all 1944, fortunately surviving damage in the Ashdown Forest area from military operations, F. Rose, J. R. Wallis, and C. West.

*151/1. Ononis reclinata L. *110, O. Hebr.; Vatersay, a very few plants on a grassy bank on the south side of Vatersay Bay, collected in 1939 but under study for some years: "chromosome number very much higher than those of the allied perennial species"—King's College Biological Expedition, comm. J. W. H. Harrison.

*151/2. Ononis repens L. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 281). *110, O. Hebr.; Vatersay, J. W. H. Harrison (1941B: 236).

151/2b. Ononis repens L. var. horrida Lange. 3, S. Devon; near Gnaton, Newton Ferrers, 1943, E. M. Phillips.

†152/12. Trigonella hamosa L. 16, W. Kent; Beckenham Place Park, 1934, E. J. Bunnett, det. J. E. Lousley.

153/7c. Medicago lupulina L. var. Willdenowiana Koch. 35, Mon.; grass verge, roadside, Staunton Road, Monmouth, 1942, R. Lewis, det. A. J. Wilmott. 39, Staffs.; roadside, Stanton: roadside on the Westlands estate, Newcastle: border of cultivated field, Maer, 1941, E. S. Edees (in *Trans. N. Staffs. Field Club*, 1941-42). 44, Carm.; Pantyffynnon, 1944, J. A. Webb, comm. Nat. Mus. Wales. 50, Denb.; Llangollen, 1943, J. A. Webb, comm. Nat. Mus. Wales.

*†154/2. Melilotus alba Desr. 13, W. Suss.; Patcham, 1939 and 1941, L. A. W. Burder. 14, E. Suss.; one plant in Buckhurst Park, 1944, D. McClintock. 21, Middx.; on a bombed site, Lupus St., London, S.W.1, 1943, D. McClintock: back of Natural History Museum, S. Kensington, 1943, one plant, A. J. Wilmott. *H.13, Carlow; towpath of R. Barrow (tidal), Graig-na-Managh, 1942, Miss E. Rawlins.

*†154/3. Melilotus arvensis Wallr. *44, Carm.; Pantyffynnon, 1944, J. A. Webb, comm. Nat. Mus. Wales. *H.13, Carlow; banks of R. Barrow at Graig-na-Managh and Sligoff, 1942, Miss E. Rawlins, seen by R. Ll. Praeger.

*†154/4. Melilotus indica (L.) All. *47, Mont.; Llansantffraid-yn-Mechain, J. A. Webb (Wade and Webb, 1943: 57).

155/1. Trifolium medium (L.) Huds. H.13, Carlow; banks of R. Slaney near Newtownbarry, 1942, Miss E. Rawlins.

155/2c. Trifolium pratense L. var. parviflorum Bab. 13, W. Suss.; a few plants on waste land, Hove, 1943, L. A. W. Burder, det. at Kew.

[*]†155/7. Trifolium arvense L. [*]35, Mon.; Newport Docks, 1943, John Macqueen, comm. Nat. Mus. Wales.

[*]155/9. Trifolium Bocconi Savi. [*]103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 282)—[found mixed with dried specimens of *T. fragiferum*; needs confirmation—Ed.].

155/10. Trifolium scabrum L. 54, N. Lincs.; Skegness, in small quantity on both golf courses, 1943, D. McClintock.

*155/11. Trifolium striatum L. *47, Mont.; cornfield, Llanllwchaiarn, J. A. Webb (Wade and Webb, 1943: 57).

155/12. Trifolium subterraneum L. 25, E. Suff.; in turf near Bussock House, Sutton Common, 1944, J. A. Whellan.

*155/13. Trifolium fragiferum L. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 282).

†155/15. TRIFOLIUM HYBRIDUM L. H.11, Kilkny; Rosbercon, etc., 1940-44, Miss E. RAWLINS. H.13, Carlow; Borris, etc., 1940-44, Miss E. RAWLINS.

*155/20. TRIFOLIUM CAMPESTRE Schreb. 14, E. Suss.; in some abundance on a roadside bank near Eridge Station, 1943, a rare plant in this part of the country and in the neighbouring parts of Kent, J. R. WALLIS (as *T. procumbens* L.). *47, Mont.; frequent, near Llanllwchaiarn, etc., J. A. Webb (Wade and Webb, 1943: 57, as *T. procumbens* L.).

155/21b. TRIFOLIUM DUBIUM Sibth. var. PYGMAEUM Soy.-Will. 34, W. Glos.; Berry Hill and Bream Meads, flowers pale yellow, 1944, S. G. CHARLES, comm. W. R. PRICE. 47, Mont.; Montgomery Castle and Careghofa, J. A. Webb (Wade and Webb, 1943; 57).

166/1. ASTRAGALUS GLYCYPHYLLOS L. 16, W. Kent; edge of Mereworth Park: Downs above Ryarsh: abundant near East Malling: all 1943, in Kent seeming equally at home on chalk or the calcareous Ragstone of the Lower Greensand, F. ROSE. 36, Heref.; Conigree Wood, also hedgeside near Gurney's Quarry, Ledbury, 1944, A. J. WILMOTT (shown by W. G. GREAVES).

166/3. ASTRAGALUS DANICUS Retz. 71, Man.; plentiful at Langness near St Michaels Island, 1937, J. A. WHELLAN.

176/8b. VICIA SEPIUM L. var. OCHROLEUCA Bast. 6, N. Som.; hedgerow near Winford, 1943, S. M. Walters (Sandwith, 1944: 472).

[*]†176/9. VICIA LUTEA L. 46, Card.; Llanbadarn, 1936, J. H. SALTER, comm. NAT. MUS. WALES. [*]H.13, Carlow; barley-field near Newtownbarry, 1942, gone in 1943, Miss E. RAWLINS, det. R. LL. PRAEGER, new to Ireland.

†176/21. VICIA MONANTHA Retz. (V. CALCARATA Desf.). 39, Staffs.; Wetmore Road (G.N.) railway sidings, Burton-on-Trent, 1936, J. E. LOUSLEY and R. C. L. BURGES, det. J. P. M. BRENAN (nomenclature according to Post, *Fl. Syr. Palest. and Sinai*, ed. 2.)

†177/1a. LENS CULINARIS Medik. ssp. ESCULENTA (Moench) Briq. 12, N. Hants; waste ground, Basingstoke, 1941, N. E. G. CRUTTWELL. 16, W. Kent; Beckenham Place Park, 1934, E. J. BUNNETT, det. J. E. LOUSLEY.

*†178/1. LATHYRUS LATIFOLIUS L. 41, Glam.; near St Mary's Well Bay, 1944, A. E. WADE. *47, Mont.; Scafell, Llandysilio, Fron, Tylwch and Hodley, chiefly a garden escape, but probably introduced at Scafell, J. A. Webb (Wade and Webb, 1943: 58).

*†178/3. Lathyrus tuberosus L. *37, Worcs.; on a farm at Badsey, 1941, A. E. Jones (*Trans. Worc. Nat. Club, 9*, 301).

*†178/7. Lathyrus hirsutus L. *33, E. Glos.; Ashchurch, 1941, C. W. Bannister (A. J. Wilmott, 1944: *J.B., 80*, 135). *H.13, Carlow; barley-field near Newtownbarry, 1942, gone in 1943—not H.12, as printed in *1941-42 Rep.*, Miss E. Booth, comm. Miss E. Rawlins.

178/8. Lathyrus Nissolia L. 8, S. Wilts.; Larkhill, 1943, D. McClintock.

[*]†178/9. Lathyrus Aphaca L. [*]H.13, Carlow; barley-field on the Carlow side of Newtownbarry, with *Vicia lutea* and *Lathyrus hirsutus*, 1942, gone in 1943, Miss E. Booth, comm. Miss E. Rawlins—see last Report, p. 486: H.12 in error.—Ed.

†178/14. Lathyrus setifolius L. 16, W. Kent; Beckenham Place Park, 1934, E. J. Bunnett, det. J. E. Lousley.

†179/1. Glycine Soja S. & Z. 35, Mon.; Newport Docks, 1942, John Macqueen, comm. Nat. Mus. Wales.

†180/1. Pisum arvense L. 47, Mont.; Cornfield south of Newtown, and Aberbechan, J. A. Webb (Wade and Webb, 1943: 58).

†181/1. Phaseolus vulgaris L. 35, Mon.; Newport Docks, 1942, John Macqueen, comm. Nat. Mus. Wales.

†183/1. Prunus Laurocerasus L. 47, Mont.; common as a planted shrub, producing seedlings and abundant in woods around Pennant, near Llanidloes, and Mount Severn Woods, J. A. Webb (Wade and Webb, 1943: 58).

*†183/5. Prunus domestica L. *47, Mont.; near Newtown, Fron and Machynlleth, J. A. Webb (Wade and Webb, 1943: 58).

†183/9. Prunus serotina Ehrh. 41, Glam.; two bushes in Moorlakes Wood near Ilston, in full flower in June 1942, J. P. M. Brenan.

†184/7. Spiraea opulifolia L. 86, Stirl.; old mill-dam, Clober, 1942 (*Glasgow Nat., 14*, 89, 1943).

*†184/10. Spiraea salicifolia L. 35, Mon.; near Lady Mill, Mounton, 1944, A. E. Wade. *47, Mont.; Fron, Garthmyl and near Derwenlas, J. A. Webb (Wade and Webb, 1943: 58). *86, Stirl.; old mill-dam near Clober, 1942 (*Glasgow Nat., 14*, 89, 1943).

184/11b. Spiraea Ulmaria L. var. denudata Boenn. 33, E. Glos.; Vicarage Road, Painswick, 1943, F. M. Day.

185/5. Rubus sulcatus Vest. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283)—new to v.-c.

185/7. Rubus nitidus W. & N. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283)—new to v.-c.

185/11. Rubus altiarcuatus Barton & Ridd. 6, N. Som.; side of Blackdown on Mendip, towards Tyning's Farm, 1940, J. P. M. Brenan and Rev. N. E. G. Cruttwell, det. Wm. Watson as *R. rotundatus* P. J. Muell. ex Genev. (Sandwith, 1944: 472)—new to v.-c.

185/24. Rubus oxyanchus Sudre. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283)—new to v.-c.

†185/38. Rubus laciniatus Willd. 59, S. Lancs.; naturalised in some quantity on waste ground at Bickerstaffe, 1943, J. A. Whellan.

185/45(2). Rubus propinquus P. J. Muell. 35, Mon.; Rumney, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/46(3). Rubus bifrons Vest. 35, Mon.; Daran Road, Risca, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/56b. Rubus Schlechtendalii Weihe var. anglicus Sudre. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283)—new to v.-c.

185/61. Rubus orthocladus Ley. 35, Mon.; Pensylvania, near Castleton, 1941, A. E. Wade, det. Wm. Watson as *R. bracteosus* Weihe —new to v.-c.

185/71. Rubus macrothyrsus Lange. 35, Mon.; Cross Keys, and between Risca and Rogerstone, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/76. Rubus adenanthus Boul. & Gil. 35, Mon.; Castleton, 1941, A. E. Wade, det. Wm. Watson. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283)—new to both v.-cc.

185/90. Rubus Radula Weihe. 103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 283)—new to v.-c.

185/92(2). Rubus Genevierii Bor. 35, Mon.; Cross Keys and near St Mellons, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/133b. Rubus Marshalli Focke & Rogers var. semiglaber Rogers. 35, Mon.; between St Mellons and Llanrumney, and Whitson, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/140b. Rubus rotundifolius Bab. ex Blox. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 283) [cf. *1937 Rep.*, 446 and 569 —Ed.]—new to v.-c.

185/143. Rubus acutifrons Ley. 35, Mon.; Darren Road, Risca, and between Risca and Cross Keys, 1942, A. E. Wade, det. Wm. Watson—new to v.-c.

185/149j. Rubus dumetorum W. & N. var. triangularis Ley. 35, Mon.; Rumney and Castleton, 1941, A. E. Wade, det. Wm. Watson (as *R. tenuiarmatus* E. Lees).

185/149i. Rubus dumetorum W. & N. var. rubriflorus Purchas. 35, Mon.; Castleton, 1941, A E. Wade, det. Wm. Watson.

185/151c. Rubus corylifolius Sm. var. conjungens Bab. 103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 283, as *R. conjungens* Bab.)—new to v.-c.

†185/156. Rubus spectabilis Pursh. 100, Clyde Is.; Arran, Glen Rosie, 1944, comm. A. J. Wilmott (specimen received via A. G. Tansley and H. Gilbert Carter).

†185/159. Rubus phoenicolasius Maxim. 36, Heref.; Dog Hill Wood, Ledbury, 1944, Miss K. M. Norman, comm. A. J. Wilmott: a single weak plant in heavy shade in natural oak-hazel wood. My friend W. G. Greaves at my request sought it in gardens of the neighbourhood and found it about 100 yards away in Miss Collins' garden at "The Windway, Upperfields": Miss Collins had removed it from her former residence, "The Willows, The Homend, Ledbury," where it was brought from "Underdown" by the previous occupier, gardener to Mr S. H. Bickham, who originally introduced it.

187/2. Geum rivale L. 30, Beds.; Fancott, Toddington, 1941, J. G. Dony.

188/1. Fragaria moschata Duchesne. 50, Denb.; Llangollen, 1943, T. R. Hodges, comm. Nat. Mus. Wales.

†188/3. Fragaria indica Andrews. 3, S. Devon; escaped at Ivybridge, 1941, E. M. Phillips.

†188/4. Fragaria chiloensis Duchesne. 47, Mont.; Scafell, Berriew, Pontdolgoch to Clatter and near Llanfechain, J. A. Webb (Wade and Webb, 1943; 58).

*189/2. Potentilla rupestris L. *47, Mont.; seen by me and others on the Breidden in the last decade: correct *C.F.*, i.e. for 48 read 47 and remove from brackets.—A. J. Wilmott.

189/6. Potentilla verna L. 36, Heref.; summit of Bradlow Knoll, near Ledbury, 1944, showing a flower on 9th August, A. J. Wilmott. 39, Staffs.; Waterhouses, 1943, E. S. Edees.

189/7. Potentilla reptans L. 103, M. Ebudes; Coll, Tiree, and Gunna, J. W. H. Harrison *et al.* (1941C: 283)—shown for 103 in *C.F.*, Ed.

*189/8. Potentilla procumbens Sibth. 14, E. Suss.; field near the High Rocks, H. W. Pugsley and J. R. Wallis. 21, Middx.; a large patch on grass at front of Natural History Museum, S. Kensington, 1943, A. J. Wilmott. 36, Heref.; abundant on Monument Hill (Malvern Range), 1944, A. J. Wilmott. *47, Mont.; Dolfor, J. A. Webb (Wade and Webb, 1943: 58). Not given for v.-c. 47 in *C.F.* and bracketed as doubtful in Hyde and Wade, *Welsh Fl. Plants*—brackets removed in annotated *C.F.* *104, N. Ebudes; Canna, J. W. H. Harrison (1939E: 100).

†189/11. Potentilla norvegica L. 35, Mon.; Redbrook, 1937, S. G. Charles, comm. Nat. Mus. Wales.

189/25b. Potentilla palustris (L.) Scop. var. villosa (Lehm.) Druce. 50, Denb.; Vron, 1943, J. A. Webb, comm. Nat. Mus. Wales.

*190/4. Alchemilla pseudominor Wilmott. 36 Heref.; Fairy Glen, Conigree Wood, Ledbury, 1944, A. J. Wilmott. *47, Mont.; by the railway line near Forden, 1943, J. Bedford, conf. and comm. A. J. Wimmott ("f. *vegeta*"). *110, O. Hebr.; S. Uist, " var. *filicaulis* occurs also," J. W. H. Harrison (1941B: 239, as *A. minor* Huds.).

190/4(2). Alchemilla pseudominor Wilmott var. filicaulis (Buser) Wilmott. 103, M. Ebudes; J. W. H. Harrison *et al.* (1941C: 284, as *A. minor* var.). 104, N. Ebudes, Fionchra, J. W. H. Harrison (1939E: 100, as *A. minor* var.).

*190/9. Alchemilla acutidens Buser (var. alpestriformis Salmon). *110, O. Hebr.; S. Uist and Berneray (Harris), J. W. H. Harrison (1941B: 239).

*191/2. Agrimonia odorata (Gouan) Mill. 55, Leics.; margin of Blakeshay Wood, Newtown Linford, 1943, F. A. Sowter. *64, M.W. Yorks.; Hackfall and Scarah Moor near Ripley, 1943, E. C. Wallace (*Nat.*, 1944: 18).

†193/2. Poterium polygamum W. & K. 35, Mon.; Rumney, 1922, A. E. Wade.

194/6a. Rosa canina L. var. lutetiana (Lem.) Baker. 47, Mont.; near Nantoer and Cemmaes, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/6g. Rosa canina L. var. flexibilis (Déségl.) Rouy. 47, Mont.; between Talerddig and Carno, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/6i. Rosa canina L. var. senticosa (Ach.) Baker f. oxyphylla (Rip.) W.-Dod. 33, E. Glos.; green lane leading to Sapperton Valley, near Sapperton, 1942, E. Nelmes, det. N. Y. Sandwith. 35, Mon.; edge of large clearing in Garth Wood, near Monmouth, 1944, R. Lewis, det. R. Melville.

194/6n. Rosa canina L. var. globularis (Franch.) Dum. 35, Mon.; edge of Garth Wood, roadside, Staunton Road, Monmouth, 1944, R. Lewis, det. R. Melville.

194/6r. Rosa canina L. var. ramosissima Rau. 47, Mont.; near Newtown, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/7. Rosa canina L. var. dumalis (Bechst.) Dum. 47, Mont., Cemmaes, Tref Caereinion and Machynlleth, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/7d. Rosa canina L. var. medioxima (Déségl.) Rouy. 33, E. Glos.; roadside about a mile W.N.W. of Daglingworth, 1942, E. Nelmes, det. N. Y. Sandwith.

194/8e. Rosa canina L. var. verticillacantha (Mér.) Baker, forma. 33, E. Glos.; roadside hedge about a mile W. of North Cerney, 1942, E. Nelmes, det. N. Y. Sandwith.

194/9b. Rosa canina L. var. Blondaeana (Rip.) Rouy f. vinacea (Baker) Rouy. 47, Mont.; near Machynlleth, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/9c. Rosa canina L. var. Beatricis Burn. & Gremli. 66, Durham; old Target Heap, Birtley, "apparently a 'furthest north' record," J. W. H. Harrison (1942: *Vasc.*, 27, 23).

*194/10c. Rosa dumetorum Thuill. var. semiglabra Rip. *103, M. Ebudes; [no locality cited] J. W. H. Harrison *et al.* (1941C: 284).

*194/10g. Rosa dumetorum Thuill. var. calophylla (Rouy.) W.-Dod. *47, Mont.; Nantoer, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/10h. Rosa dumetorum Thuill. var. platyphylla (Rau.) W.-Dod. 47, Mont.; near Nantoer, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 58).

194/10m. Rosa dumetorum Thuill. var. hemitricha (Rip.) W.-Dod. 35, Mon.; banks of R. Wye, between Hadnock Quarries and Symond's Yat, 1943, R. Lewis, det. R. Melville.

194/12e(2). Rosa Afzeliana Fr. var. glaucophylla (Winch) W.-Dod. 33, E. Glos.; Welsh Way, about 3 m. N. of Cirencester, 1942, E. Nelmes, det. N. Y. Sandwith.

194/13f. Rosa coriifolia Fr. var. Bakeri (Déségl.). 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 284).

*194/14b. Rosa micrantha Sm. var. typica Chr. *47, Mont.; Ceinws, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 59).

194/14d. Rosa micrantha Sm. var. operta Pug. 35, Mon.; wood edge, Lady Park Wood, between Hadnock Quarries and Symond's Yat, 1943, R. Lewis, det. R. Melville—new to v.-c. 35, A. E. Wade.

194/19a. Rosa tomentosa Sm. var. typica W.-Dod. 47, Mont.; Llandinam, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 59). Recorded for v.-c. 47 in Hyde and Wade, *Welsh Fl. Plants* but not in *C.F.*

194/19 l. Rosa tomentosa Sm. var. dimorpha (Bess.) Déségl. 47, Mont.; near Llanbrynmair, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 59).

194/20a. Rosa Sherardi Davies var. omissa (Déségl.) W.-Dod. 35, Mon.; in hedge, roadside, Staunton Road, Monmouth, 1944, R. Lewis, det. R. Melville.

194/20b. Rosa Sherardi Davies [var. typica W.-Dod.]. 47, Mont.; near Newtown, J. A. Webb, det. E. B. Bishop (Wade and Webb, 1943: 59)—new to v.-c. 47, not listed separately in *C.F.*

194/20e. Rosa Sherardi Davies var. pseudomollis (E. G. Baker). 35, Mon.; on rocky ledges, Taren-yr-Esgob, Black Mountains, near Llanthony, 1944, R. Lewis, det. R. Melville (as var. *typica* forma *pseudomollis* (E. G. Baker) W.-Dod.).

194/20k. Rosa Sherardi Davies var. cinerascens (Dum.). 73, Kirkc.; Glenfair (1943: *Vasc.*, *28*, 31).

194/21b. Rosa mollis Sm. var typica W.-Dod. 103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 284)—shown for 103 in *C.F.*—Ed.

*194/23. Rosa spinosissima L. *47, Mont.; Dolfor Main Road, J. A. Webb (Wade and Webb, 1943: 59, as var. *pimpinellifolia* (L.) Druce).: limestone cliffs above Llanymynech, 1942, J. W. Gough and N. Y. Sandwith.

*194/23×. ×Rosa Sabini Woods. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 285).

195/1b. Pyrus Malus var. paradisiaca L. 47, Mont.; Abermule, J. A. Webb (Wade and Webb, 1943: 59).

196/1k. Crataegus monogyna Jacq. var. splendens Druce. 17, Surrey; Warlingham, 1942, fruits 14 × 12 mm., C. E. Britton.

*196/2. CRATAEGUS OXYACANTHOIDES Thuill. *39, Staffs.; Seabridge Lane, Newcastle, 1942, E. S. EDEES, det. S. B. BATKO. *104, N. Ebudes; J. W. H. Harrison (1939E: 102 as *C. Oxyacantha* L.).

*196/2b. CRATAEGUS OXYACANTHOIDES Thuill. var. ERIOCALYX (Freyn) Druce. *69, Westm.; Brackember Wood, F. M. Wilkinson (1943: *Vasc.*, *28*, 31, as *C. Oxyacantha* L. var. *eriocalyx* Dr.).

†196/6(2). CRATAEGUS ORIENTALIS M.B. 6, N. Som.; "Mr J. P. M. Brenan points out that this is the correct name for the tree on Shapwick Moor, which was recorded as *C. Azarolus* L. in 'Bristol Botany in 1920 and 1921.' The tree was still there in 1942" (Sandwith, 1943: 365).

*†197/2. COTONEASTER MICROPHYLLA Wallich. *47, Mont.; Derwenlas and Lower Aberangell, J. A. Webb (Wade and Webb, 1943: 59).

*†197/3. COTONEASTER SIMONSII Baker. *47, Mont.; Machynlleth area at Forge and Gelligoch, frequent in woods from Dolgadfan to Pennant, Llwchygarreg and Derwenlas, J. A. Webb (Wade and Webb, 1943: 59).

199/7. SAXIFRAGA PLATYPETALA Sm. 110, O. Hebr.; around the summit of Beinn Mhor, S. Uist, 1944, N. POLUNIN, det. A. J. WILMOTT—leaves only, but not those of *S. hypnoides* L. *sensu stricto*.

[*]199/10. SAXIFRAGA HYPNOIDES L. [*]103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 285)—[not seen, and cf. *B.E.C. 1939 Rep.*, 245, 1942]. [*]110, O. Hebr.; N. face of Beinn Mhor, S. Uist, Harrison *et al.* (1944: 114)—[not seen, may be *S. platypetala* Sm.—A. J. WILMOTT].

199/17. SAXIFRAGA GRANULATA L. 35, Mon.; banks of River Wye, between Symond's Yat and Hadnock Quarries, near Monmouth, 1944, R. LEWIS. 64, M.W. Yorks.; in turf with *Viola lutea* and *Saxifraga hypnoides* on Greenhow Hill, Pateley Bridge, alt. c. 1300′, 1943, E. C. WALLACE.

*199/20. SAXIFRAGA TRIDACTYLITES L. *47, Mont.; Careghofa quarries, J. A. Webb, 1940 (Wade and Webb, 1943: 59).

[*]†199/24. SAXIFRAGA UMBROSA L. [*]47, Mont.; hedges at Bont Dolgadfan, and lineside at Nantoer, J. A. Webb (Wade and Webb, 1943, 59).

203/1. CHRYSOSPLENIUM ALTERNIFOLIUM L. 51, Flint; by a stream near Northop, plentifully, 1938, flowering earlier than *C. oppositifolium* L. which grows with it, J. A. WHELLAN.

207/2. RIBES NIGRUM L. 33, E. Glos.; Upcote, 1943, Miss L. ABELL.

*†207/5. Ribes alpinum L. *47, Mont.; Churchstoke in some quantity and near Machynlleth, J. A. Webb (Wade and Webb, 1943: 59).

†207/7. Ribes sanguineum Pursh. 47, Mont.; rocky wood, New Mill, probably bird sown, J. A. Webb, 1940 (Wade and Webb, 1943: 59).

*209/1. Tillaea muscosa L. *6, N. Som.; Witham Park, 1944, Mrs J. D. Grose, comm. J. D. Grose. *8, S. Wilts.; near Yarnfield Gate, 1944, J. D. Grose.

*211/1. Sedum purpureum Link. 22, Berks.; Nine-mile Ride, Wokingham, 1944, D. McClintock (as *S. Telephium*). *86, Stirl.; Helensburgh, 1941 (*Glasgow Nat.*, *14*, 89, 1943, as *S. Telephium* L.).

†211/1(2). Sedum spurium M.B. 47, Mont.; naturalised at Kerry and Penstrowed, J. A. Webb (Wade and Webb, 1943: 59).

*211/2. Sedum rupestre L. *H.11, Kilkny.; on rocks, Rosbercon, Bearstown, Carrigcloney, etc., 1940-44, Miss E. Rawlins, det. R. Ll. Praeger.

†211/3. Sedum reflexum L. 47, Mont.; rocks below Montgomery Castle, 1943, J. Bedford, comm. A. J. Wilmott.

†211/7. Sedum album L. 47, Mont.; wall, Welshpool, 1943, J. Bedford, det. and comm. A. J. Wilmott. H.12, Wexford; Arthurstown, 1940-44, Miss E. Rawlins.

†212/1. Sempervivum tectorum L. 41, Glam.; on farm building wall, Llanishen, 1944, well naturalised, but scarce in the vice-county, E. Vachell.

213/2×3. Drosera longifolia L. × D. rotundifolia L. 46, Card.; Borth Bog, J. H. Salter (1941: *N.W. Nat.*, *16*, 92);—leaves nearly as in *D. longifolia* but sometimes dilated distally; scape twice the length of the leaves, A. J. Wilmott.

*216/1. Myriophyllum spicatum L. *47, Mont.; Newtown, Machynlleth and Llanllwchaiarn, J. A. Webb (Wade and Webb, 1943: 60). *71, Man; Puill-dooey, Ramsey, 1943, C. I. Paton, comm. A. J. Wilmott—add to *C.F.* but see Paton (1933: *N.W. Nat.*, 569) for previous record, Ed.

216/2. Myriophyllum alterniflorum DC. 34, W. Glos.; Wye at Symonds Yat, 1943, first record for Flora district 4, S. G. Charles, comm. W. R. Price. 98, Argyll M.; Loch Tulla and Loch Ba, 1943; E. C. Wallace.

*216/3. Myriophyllum verticillatum L. *35, Mon.; reens, Whitewall Common, Magor, 1944, R. Lewis.

*217/2. CALLITRICHE OBTUSANGULA Le Gall. 63, S.W. Yorks.; ditch near R. Torne, Hatfield Woodhouse, 1944, J. M. Taylor (*Nat.*, 1945, 23). *66, Durham; in a ditch on Birtley Fell, now destroyed by a new road, J. W. H. Harrison (1942: *Vasc.*, *27*, 7).

*217/6. CALLITRICHE AUTUMNALIS L. *39, Staffs.; Lichfield canal, Whittington, 1943, R. C. L. BURGES, det. J. E. LOUSLEY. Specimens sent to me had smaller fruit and no wing to the keel of the fruit: is *C. truncata* Guss. growing there also? A. J. WILMOTT. *47, Mont.; in quantity in the canal between Welshpool and Pool Quay, J. A. Webb (Wade and Webb, 1943: 60). 67, Northumb. S.; in Bolan Lake, the only other habitat in v.-c. 67—Prestwick Carr—" long since destroyed," Miss K. B. Blackburn (1942: *Vasc.*, *27*, 6); common in Crag Lough, J. W. H. Harrison and W. A. Clark (*Vasc.*, *27*, 32). *103, M. Ebudes; Tiree, J. W. Harrison *et al.* (1941C: 286).

218/1. PEPLIS PORTULA L. 64, M.W. Yorks.; roadside hollows near Blubberhouses; 65, N.W. Yorks.; Pillmore Carr near Sharrow; both 1943, E. C. WALLACE.

220. EPILOBIUM. All records from v.-cc. 3, 7, 8, 20, 30, 101, and all from J. E. Lousley, det. or confirmed by G. M. Ash.

*220/1. EPILOBIUM ANGUSTIFOLIUM L. *H.11, Kilkny.; woods, Dysertmore and Carrig-a-Neal, 1940-44, Miss E. RAWLINS. *H.13, Carlow; woods of Borris demesne, 1940-44, Miss E. RAWLINS.

*220/3. EPILOBIUM HIRSUTUM L. *110, O. Hebr.; a single plant in a marsh near Lochboisdale, S. Uist, R. B. Cooke (1944: *Vasc.*, *29*, 6).

*220/5. EPILOBIUM TETRAGONUM L. 30, Beds.; Dunton, 1942: Aspley Wood, 1943, J. G. DONY. *110, O. Hebr.; Eriskay and S. Uist, J. W. Harrison (1941B: 242).

*220/6. EPILOBIUM LAMYI F. Schultz. *110, O. Hebr.; Fuday, Eriskay, and S. Uist, J. W. H. Harrison (1941B: 242).

220/7. EPILOBIUM OBSCURUM Schreb. 101, Cant.; deserted garden, Dunmore House, W. Loch Tarbert, 1944, J. S. L. GILMOUR.

220/7×10. EPILOBIUM MONTANUM L. × OBSCURUM Schreb. 101, Cant.; deserted garden, Dunmore House, W. Loch Tarbert, 1944, J. S. L. GILMOUR.

*220/7(2). EPILOBIUM ADENOCAULON Hausskn. *7, N. Wilts.; Coate Water, 1944, J. D. GROSE. 16, W. Kent; in abundance by the River Medway between Hartlake Bridge and Tonbridge, 1943, J. R. WALLIS: ride in Chevening Park, 1943, J. E. LOUSLEY and R. C. L. BURGES.

17, Surrey; roadside near Worplesdon, 1943, J. E. Lousley, R. C. L. Burges and R. H. Hall: dried-up bed of Fetcham Mill-pond, 1944, J. E. Lousley. 30, Beds.; Deadmansea Wood, Whipsnade, 1940, V. H. Chambers: Hinwick, Podington, 1941, J. G. Dony: Coopers Hill, Ampthill, 1941, V. H. Chambers and J. G. Dony: Fancott, 1942, A. J. Wilmott: Aspley Wood, 1943, J. G. Dony: Rushmere, Heath and Reach, 1944, E. Milne-Redhead and J. G. Dony: Tingnath, 1944, E. Milne Redhead. *36, Heref.; wooded bank by main road from Monmouth to Ross, near Ganarew, 1944, J. W. Gough and N. Y. Sandwith. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 286). *110, O. Hebrides; S. Uist, J. W. H. Harrison (1941B: 242).

220/7(2)×10. Epilobium adenocaulon Haussk. × E. montanum L. 30, Beds.; Deadmansea Wood, Whipsnade, 1942, V. H. Chambers and J. G. Dony: Marston Thrift, 1943, J. G. Dony.

*220/8. Epilobium roseum Schreb. 3, S. Devon; air-raid debris, Plymouth, 1943, E. M. Phillips. *7, N. Wilts.; wall top near Christ Church, Swindon, 1943 [J. D. Grose] (*Rep. Marlb. Coll. N.H.S., No. 92* (1944) 11); the first certain record for v.-c. 7 (J. D. Grose: 1944: 347). 20, [Beds.]; Ravensdell Wood, Studham, 1942, J. G. Dony. 21, Middx.; under wall near Tower of London, 1943, J. E. Lousley. 30, Beds.; Billington, 1940, V. H. Chambers and J. G. Dony: Greenfield Hill, 1940, V. H. Chambers: Harborne Crawley, 1942, V. H. Chambers and J. G. Dony: Deadmansea Wood, Whipsnade, 1942: Aspley Wood, 1943, J. G. Dony. *44, Carm.; near Llanelly, 1944, J. A. Webb, comm. Nat. Mus. Wales. *47, Mont.; garden weed at Newtown, and Meifod, J. A. Webb (Wade and Webb, 1943: 60). 64, M.W. Yorks.; Mackershaw Wood, Ripon, 1943, E. C. Wallace. *101, Cant.; Dunmore House, W. Loch Tarbert, 1944, J. S. L. Gilmour.

*220/9. Epilobium lanceolatum Seb. & Maur. *8, S. Wilts.; Bower Chalke, 1943, J. D. Grose (1944: *Wilts. A. and N.H.M.*, 347). 14, E. Sussex; Eridge Green, 1943, J. E. Lousley and J. R. Wallis. 16, W. Kent; Wingate Wood, North Halling, 1944, J. E. Lousley, F. Rose and C. West. 17, Surrey; near Hascombe, 1944, J. E. Lousley and E. B. Bishop.

220/10×4. Epilobium montanum L. × E. parviflorum Schreb. 17, Surrey; Greystone Limeworks, Merstham, 1943, J. E. Lousley. 30, Beds.; Knotting, 1942, J. G. Dony.

220/10×7. Epilobium montanum L. × E. obscurum Schreb. 30, Beds.; Marston Thrift, 1943, J. G. Dony: Aspley Wood, 1943, J. G. Dony.

220/10×8. Epilobium montanum L. × roseum Schreb. 64, M.W. Yorks.; garden weed, Headingley, Leeds, 1944, W. A. Sledge (*Nat.*, 1945: 23).

220/12. Epilobium alsinifolium Vill. 65, N.W. Yorks.; Brant Side, Upper Dentdale, 1944, W. A. Sledge (*Nat.*, 1944: 144).

220/12×10. Epilobium alsinifolium Vill. × montanum L. [65, N.W. Yorks.; "the Uldale plant so recorded in *Suppl. Yorks. Floras* has been seen by G. M. Ash, who refers it to *E. montanum*, but a single minute specimen from Cautley Spout (J.F.P., 20/8/02) so determined by F. A. Lees and C. E. Salmon may be correct"—W. A. Sledge (*Nat.*, 1945: 24).]

220/13. Epilobium alpinum L. 110, O. Hebr.; Beinn Mhor, S. Uist, with broad leaves, Harrison *et al.* (1944: 114, as *E. anagallidifolium* Lam.).

†220/15. Epilobium nummularifolium R. Cunn. 41, Glam.; rubbish tip, Fochriw, 1944, Bruce Campbell, comm. Nat. Mus. Wales. 69, Westm.; still on stony edge of stream just below Alcock Tarn, Grasmere, 1943, R. C. L. Burges (not Allcock Farm as in *B.E.C. 1929 Rep.*, 116). 75, Ayr; Skelmorlie, 1941 (*Glasgow Nat.*, *14*, 89, 1943). 86, Stirl.; Bardowie, 1942 (*Glasgow Nat.*, *14*, 90, 1943).

220/17. Epilobium pedunculare A. Cunn. 65, N.W. Yorks.; Brant Side, Upper Dentdale, at 1200 ft., 1944, W. A. Sledge (*Nat.*, 1944: 144).

*†223/1. Oenothera biennis L. *47, Mont.; railway banks, Dovey Junction, J. A. Webb (Wade and Webb, 1943: 60).

*225/2. Circaea canadensis Hill. *47, Mont.; very scarce by the Llyfnant Rock at Glaspwll, J. A. Webb (Wade and Webb, 1943: 60).

†239/1. Eryngium campestre L. 12, N. Hants.; [the station at S. Wonston was ploughed up in 1942, Hon. W. J. L. Palmer]: small increasing patch in cornfield, Mapledurwell, 1943 (Miss Thorpe of Mapledurwell showed it to) N. E. G. Cruttwell.

244/1. Smyrnium Olusatrum L. 17, Surrey; Upper Selsdon Road, Croydon, 1943 and 1944, C. T. Prime, comm. J. E. Lousley.

*250/1. Carum Carvi L. *104, N. Ebudes; amongst grass in the Kinloch Woods, Rhum, R. B. Cooke (1944: *Vasc.*, *29*, 6).

250/2. Carum verticillatum (L.) Koch. 101, Cant.; grassy place by West Loch Tarbert, 1944, J. S. L. Gilmour.

*†250/3. Carum Petroselinum (L.) B. & H. *48, Mer.; Dolgelly, J. A. Webb, 1941, comm. Dept. Bot., Nat. Mus. Wales.

250/4. Carum segetum (L.) B. & H. 55, (Rutland); near Tixover, 1943, A. E. Wade, comm. Nat. Mus. Wales.

251/1. Sison Amomum L. 63, S.W. Yorks.; abundant on heavy clay soil in lanes around Fishlake, near Doncaster, J. M. Taylor (*N.W. Nat.*, *18*, 113).

†252/1. Falcaria vulgaris Bernh. 30, Beds.; Harrold, Miss G. H. Day, 1941; Miss Day has known the plant in this locality since 1911; comm. J. G. Dony (as *Prionitis Falcaria* (L.) Dum.).

*253/2. Sium erectum Huds. *47, Mont.; in some quantity in the Shropshire Union Canal, much scarcer near Luggy, near Pool Quay and near Derwenlas, J. A. Webb (Wade and Webb, 1943: 60).

255/1. Pimpinella major Huds. 31, Hunts.; in shady osier-bed by the R. Ouse, Eynesbury, 1944, S. J. Peck, comm. A. J. Wilmott.

*257/1. Myrrhis Odorata L. *47, Mont.; bank near Glanyrafon Halt: in profusion between Mount Pleasant and Llanfair Caereinion: by the Rhiew at New Mills and Manafon: Pedair Ffordd, J. A. Webb (Wade and Webb, 1943: 60): roadside at 800 ft. between Hirnant and Pen-y-bont-fawr, 1942, J. W. Gough and N. Y. Sandwith. *104, N. Ebudes; Eigg and Canna, J. W. H. Harrison (1939E: 104).

*258/2. Chaerophyllum temulum L. *104, N. Ebudes; Eigg and Canna, J. W. H. Harrison (1939E: 104). *H.12, Wexford; Killowen, 1944, Miss E. Rawlins.

259/1. Scandix Pecten-veneris L. 14, E. Suss.; cornfield near Eridge Station, 1943, a scarce species in this district, J. R. Wallis.

*265/1. Oenanthe aquatica (L.) Poir. 33, E. Glos.; abundant in Coombe Hill Canal and adjoining rheens, 1941, E. Nelmes. *35, Mon.; Coedkernew, Marshfield and St Brides, Hamilton (1909: *Flora of Mon.*, *33*): near Pîl-du, St Mellons, 1944, A. E. Wade.

265/4. Oenanthe pimpinelloides L. 33, E. Glos.; grassy meadow by Coombe Hill Canal, 1941, E. Nelmes. 34, W. Glos.; fields near Severn Bridge, N.E. of Sharpness, 1942, E. Nelmes.

*265/6. Oenanthe Lachenalii C. Gmel. *64, M.W. Yorks.; Farnham Mires and marshy ground north of Foster Flat between Copgrove and Bishop Monkton, 1943, E. C. Wallace and W. A. Sledge (*Nat.*, 1944: 18)—add to *C.F.* but see *Top. Bot. Suppl.* (1905: 42) for previous record. 101, Cant.; brackish marsh, West Loch Tarbert, 1944, J. S. L. Gilmour. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 104).

†277/1. Heracleum Mantegazzianum S. & L. 47, Mont.; Pantyffrid and Meifod, J. A. Webb (Wade and Webb, 1943: 60).

277/2b. Heracleum Sphondylium L. var. angustifolium Huds. 47, Mont.; not uncommon, Vastre, etc., J. A. Webb (Wade and Webb, 1943: 60).

†279/1. CORIANDRUM SATIVUM L. 19, N. Essex; in two cultivated fields near Coggeshall, where it was recorded by Ray, appearing well-established in one: one or two plants also by roadside at Marks Tey: 1944, J. A. WHELLAN, conf. J. E. LOUSLEY.

*283/5. CAUCALIS NODOSA Scop. *47, Mont.; Montgomery and Dolforwyn Castles, J. A. Webb (Wade and Webb, 1943: 60).

†285/3. CORNUS STOLONIFERA Michx. 44, Carm.; Garnant, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; naturalised near Derwenlas, and Newton Dingle, J. A. Webb (Wade and Webb, 1943: 60).

†287/1. SAMBUCUS RACEMOSA L. 47. Mont.; on the northern flanks of the Kerry Hills at 1200 ft., some bushes about twenty years old amongst *Sambucus nigra* L. but they do not seem to be flourishing, 1941, Miss M. G. BENTHAM EVANS, comm. NAT. MUS. WALES.

†287/2b. SAMBUCUS NIGRA L. var. LACINIATA L. 47, Mont.; bank by the Dolfor Old Road at Newtown, but near houses and probably introduced, Glaspwll Valley near Gelligoch, J. A. Webb (Wade and Webb, 1943: 60). 86, Stirl.; old mill-dam near Clober, 1942 (*Glasgow Nat.*, *14*, 89, 1943).

287/2e. SAMBUCUS NIGRA L. var. VIRIDIS Ait. 21, Middx.; a single tree near Ruislip, 1942, Dr S. BATKO, comm. N. Y. SANDWITH—but see *Plant Notes*, ED.

287/3. SAMBUCUS EBULUS L. 24, Bucks.; plentiful in a ditch by roadside three miles east of Buckingham towards Stowe, 1942, A. B. JACKSON.

*†288/2. VIBURNUM LANTANA L. *47, Mont.; small bushes in hedges above Llanllwchaiarn, obviously from seed from a bush in the Newtown Hospital grounds, and woods in Glaspwll Valley, J. A. Webb (Wade and Webb, 1943: 60). 64, M.W. Yorks.; between Gisburn and Gargrave, 1943, J. A. WHELLAN (1943: *N.W. Nat.*, *18*, 324)—doubtfully indigenous in this locality; bracketed in *C.F.*

†289/1. SYMPHORICARPUS RACEMOSUS Michx. 44, Carm.; hedges far from houses, Cwmgwili, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; frequently naturalised in hedges, Newtown, etc., J. A. Webb (Wade and Webb, 1943: 60).

†292/1. LEYCESTERIA FORMOSA Wallich. 35, Mon.; Cuckoo Wood, near Llandago, 1944, A. E. WADE, comm. NAT. MUS. WALES. 41, Glam.; Penylan: Llandough-juxta-Cardiff: well established in both localities, E. VACHELL. 44, Carm.; Rhydowen, 1944, J. A. WEBB, comm. NAT. MUS. WALES.

296/2×9. ×GALIUM OCHROLEUCUM Wolf. 30, Beds.; Dunstable Downs, 1943, B. VERDCOURT.

296/1. GALIUM BOREALE L. 65, N.W. Yorks.; Gainford Island above Piercebridge, 1943, C. M. Rob (*Nat.*, 1944: 19).

296/3. GALIUM ERECTUM Huds. 36, Heref.; grassy bank in Grammar School grounds, Ledbury, 1944, A. J. WILMOTT.

296/5. GALIUM PUMILUM Murray. 20, [Beds.]; Downs, Cuddington, 1944, E. MILNE-REDHEAD.

296/6. GALIUM ULIGINOSUM L. 35, Mon.; boggy fields at Trelleck, 1943, S. G. CHARLES and R. LEWIS, confirmed by C. E. BRITTON.

†298/5. ASPERULA ARVENSIS L. 35, Mon.; site of a poultry farm, Kymin Hill, Monmouth, 1929, S. G. CHARLES, comm. NAT. MUS. WALES.

299/3. CRUCIANELLA STYLOSA Trin. 53, S. Lincs.; grass verge by country lane, one large plant, Quarrington, 1944, Miss I. M. BARBER, det. and comm. A. J. WILMOTT.

*301/3. VALERIANA DIOICA L. *104, N. Ebudes; Eigg, J. W. H. Harrison (1939E: 105).

*†302/1. CENTRANTHUS RUBER (L.) DC. *47, Mont.; Newtown, Montgomery, near Meifod, Llanfair Caereinion, Llanllwchaiarn, Llanmerewig and Nantoer, J. A. Webb (Wade and Webb, 1943: 60).

304/3. VALERIANELLA DENTATA (L.) Poll. 33, E. Glos.; Cotswold Farm, Duntisbourne Abbotts, 1943, Mrs SCARLETT, det. and comm. A. J. WILMOTT: a form with the leaves subentire, ligulate-lanceolate; but the fruits are normal and several similar specimens are in *Herb. Mus. Brit.*

304/3b. VALERIANELLA DENTATA (L.) Poll. var. MIXTA (L.) Dufresne. 35, Mon.; by Thicket-Wood, Roggiett, 1944, A. E. WADE.

*304/4. VALERIANELLA CARINATA Lois. *45, Pemb.; old walls, gardens and waste places, about Tenby, 1944, Mrs F. L. REES, comm. NAT. MUS. WALES. *H.12, Wexford; cottage garden, Edermine on R. Slaney, 1942, Miss E. BOOTH, comm. Miss E. RAWLINS. *H.13, Carlow; gardens and walls, Borris, 1939-1944, Miss E. RAWLINS, det. R. LL. PRAEGER.

*306/2. DIPSACUS PILOSUS L. *66, Durham; Woodland, J. Rand (1944: *Vasc.*, *29*, 24).

*308/5. SCABIOSA ARVENSIS L. *110, O. Hebr.; Vatersay, J. W. H. Harrison (1941B: 245, as *Knautia arvensis* (L.) Coult.).

†312/6. SOLIDAGO CANADENSIS L. 44, Carm.; coal tip near Ammanford, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; Carno station, J. A. Webb (Wade and Webb, 1943: 61).

†318/4. ASTER NOVI-BELGII L. 44, Carm.; waste place, Pantyffynnon, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; between Newtown and Llanllwchaiarn, Llandinam, Caersws, railway and river bank near Derwenlas, and Machynlleth, J. A. Webb (Wade and Webb, 1943: 61).

*318/19. ASTER TRIPOLIUM L. *47, Mont.; Dovey salt marsh, and in small quantity by the Llyfnant and Dovey Junction, J. A. Webb (Wade and Webb, 1943: 61). 98, Argyll M.; shore at south end of Isle of Seil, 1943, Mrs E. DORAN, comm. A. J. WILMOTT—about nine inches in height.

*†320/3. ERIGERON CANADENSIS L. 3, S. Devon; air-raid debris, Plymouth, 1943, E. M. PHILLIPS. 34, W. Glos.; Lydney, 1942, S. G. CHARLES, comm. W. R. PRICE. *55, Leics.; old quarry, Sapcote, 1943, F. A. SOWTER.

*324/4. FILAGO GALLICA L. *104, N. Ebudes; Rhum, new to Scotland, J. W. H. Harrison (1939E: 105).

*324/5. FILAGO MINIMA Pers. *47, Mont.; shaly bank east of Commins Coch, J. A. Webb (Wade and Webb, 1943: 61): Breidden Hills, 1943, J. BEDFORD, comm. A. J. WILMOTT.

*326/1. ANTENNARIA DIOICA (L.) Gaertn. *33, E. Glos.; Foxcote, 1943, not the patch recorded in 1937 which has been ploughed up, but another station, Miss L. ABELL.—add * to record in *B.E.C. 1937 Rep.*, 482 and add to *C.F.*

326/1b. ANTENNARIA DIOICA (L.) Gaertn. var. HYPERBOREA DC. 104, N. Ebudes, on Barkeval, Rhum, J. W. H. Harrison (1939E: 106).

*†327/1. ANAPHALIS MARGARITACEA (L.) C. B. Clarke. 35, Mon.; old quarry at the Wyndcliff, Nr. Tintern Abbey, 1943, R. LEWIS. *47, Mont.; established on the edges of the Green at Llanwrin, J. A. Webb (Wade and Webb, 1943: 61).

328/2b. GNAPHALIUM ULIGINOSUM L. var. PSEUDO-PILULARE (A. & G.) Scholtz. 64, M.W. Yorks.; a few plants in swampy hollow by road east of Blubberhouses, 1943, E. C. WALLACE.

333/1. INULA HELENIUM L. 103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 288)—given for 103 in *C.F.*—ED.

333/5. INULA CRITHMOIDES L. 2, E. Cornw.; Baby Bay, Polzeath, 1943, Miss C. LONGFIELD.

*333/4. Inula Conyza DC. *47, Mont.; Aberbechan, Kerrydale, near Cemmaes, near Pantyffridd, and Careghofa quarries, J. A. Webb (Wade and Webb, 1943: 61).

†339/3. Ambrosia artemisifolia L. 35, Mon.; Alexandra Dock, Newport, 1942, John Macqueen, comm. Nat. Mus. Wales.

†339/4b. Ambrosia trifida L. var. integrifolia (Willd.) Torr. & Gray. 60, W. Lancs.; one plant in waste ground at Ansdell, 1943, J. A. Whellon, det. J. E. Lousley.

†341/3. Xanthium spinosum L. 30, Beds.; Bedford, 1937, L. W. Wilson, comm. J. G. Dony.

353/2d. Bidens tripartita L. var. radians (Beck). 41, Glam.; canal side, Llandaff North, 1944, with perhaps more conspicuous ray-florets than at the first station, E. Vachell.

*353/1. Bidens cernua L. 35, Mon.; reens, Whitewall Common, Magor, 1944, R. Lewis. *47, Mont.; canal near Pentre Leylin and Four Crosses, near Luggy and Garthmyl, J. A. Webb (Wade and Webb, 1943: 61).

†354/1. Galinsoga parviflora Cav. 59, S. Lancs.; weed in Liverpool Botanic Gardens, 1943, J. A. Whellan, comm. J. E. Lousley.

354/2b. Galinsoga quadriradiata Ruiz & Pav. var. hispida (DC.) Thell. 11, S. Hants.; Hurn, near Christchurch, 1943, Capt. A. J. Maudsley, comm. A. J. Wilmott. 17, Surrey; near Claygate, 1943, W. R. Sherrin, comm A. J. Wilmott.

†355/2. Madia sativa Molina. 17, Surrey; variable and in quantity in field of flax, Nutfield, 1943, where it was detected by E. J. Bunnett and shown by him *in situ* to J. E. Lousley.

†368/1. Anthemis tinctoria L. 21, Middx.; site of the Churchyard of St Olave's, Silver Street, London, E.C.2, 1944, D. McClintock.

368/2c. Anthemis nobilis L. var. discoidalis Harrison. 17, Surrey; in the lawns of Kew Gardens, the form recorded by G. Nicholson (see Salmon, *Fl. Surrey*, 387), and still there, N. Y. Sandwith.

368/4. Anthemis Cotula L. 3, S. Devon; air-raid debris, Plymouth, 1943, E. M. Phillips. *104, N. Ebudes; Eigg and Canna, J. W. H. Harrison (1939E: 106).

†370/8. Chrysanthemum maximum DC. 47, Mont.; Caersws, J. A. Webb (Wade and Webb, 1943: 61).

*†371/3. MATRICARIA SUAVEOLENS (Pursh) Buch. *47, Mont.; Newtown, frequent up to 1300 ft. above Dylife, J. A. Webb (Wade and Webb, 1943: 61, as *M. matricarioides* (Less.) Porter). *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 288).

378/1. ARTEMISIA ABSINTHIUM L. 21, Middx.; waste ground, King's Road, Chelsea, 1943, J. E. LOUSLEY and W. J. SLADEN.

380/1. PETASITES HYBRIDUS (L.) G.M. & S., emend. Fritsch. H.31, Louth; the female plant, Dundalk, 1943, E. N. CARRUTHERS, comm. A. J. WILMOTT.

*†380/2. PETASITES ALBUS (L.) Gaertn. 12, N. Hants.; a large patch in a wooded dell near Basing, 1943, N. E. G. CRUTTWELL. 50, Denb.; by a stream near Llangollen, well established in good quantity, 1937-1943, J. A. WHELLAN. *75, Ayr; Dalry, 1942 (*Glasgow Nat.*, *14*, 90, 1943).

*†380/3. PETASITES FRAGRANS Presl. *47, Mont.; Fron, Pentre near Meifod and Bont Dolgadfan, J. A. Webb (Wade and Webb, 1943: 61).

380/4. PETASITES JAPONICUS (Sieb. & Zucc.) F. Schmidt. 3, S. Devon; Elfordleigh, Plympton St Mary, 1943, E. M. PHILLIPS (as *P. albus*), det. A. J. WILMOTT.

†381/1. DORONICUM PARDALIANCHES L. 35, Mon.; naturalised on railway bank at Hadnock, near Monmouth, 1944, R. LEWIS.

*383/6. SENECIO ERUCIFOLIUS L. *47, Mont.; Careghofa, lineside near Four Crosses, canal bank near Berriew, J. A. Webb (Wade and Webb, 1943: 62).

*†383/7. SENECIO SQUALIDUS L. 3, S. Devon; abundant everywhere on air-raid debris, Plymouth, 1943, and hybridising with *S. vulgaris* var. *radiatus*, E. M. PHILLIPS (see *Plant Notes*). 37, Worcs.; waste places, Droitwich, 1944, F. M. DAY. *47, Mont.; Dovey Junction, Commins Coch, Welshpool, Buttington and Newtown, J. A. Webb (Wade and Webb, 1943: 62): quarry at foot of Breidden Hill, 1942, J. W. GOUGH and N. Y. SANDWITH. 51, Flint; Hawarden and Mold, 1943, Miss R. A. PENNETHORNE, comm. DEPT. BOT., OXFORD UNIV.

*383/8. SENECIO VISCOSUS L. *47, Mont.; Llansantffraid, Llanfechain, and Tylwch to Llanidloes, J. A. Webb (Wade and Webb, 1943: 62).

383/10e. SENECIO VULGARIS L. var. RADIATUS Koch. 3, S. Devon; abundant everywhere on air-raid debris, Plymouth, 1943, E. M. PHILLIPS. 47, Mont.; Brynhyfryd, Dovey Junction, Pool Quay and Llanidloes, J. A. Webb (Wade and Webb, 1943: 62). 50, Denb.; Wrexham, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

†383/15. SENECIO VERNALIS W. & K. 4, N. Devon; Barnstaple Boys' Grammar School new playing field ("Kew"—*Trans. Devon Ass. Adv. Sci.*, *75*, 57: 1943).

†385/1. CALENDULA OFFICINALIS L. 44, Carm.; Bynea, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 47, Mont.; apparently established on a shaly bank above the canal, Llanllwchaiarn, J. A. Webb (Wade and Webb, 1943: 62).

*391/1. CARLINA VULGARIS L. *47, Mont.; limestone slopes and screes at Careghofa, and Commins Coch, J. A. Webb (Wade and Webb, 1943: 62).

*393/1. ARCTIUM LAPPA L. 39, Staffs.; roadside between Mitton and Penkridge, 1944, E. S. EDEES. *47, Mont.; Great Ham near Rhydygroes, J. A. Webb (Wade and Webb, 1943: 62)—not recorded for v.-c. 47 in the *Comital Flora*, but bracketed as doubtful in Hyde and Wade, *Welsh Fl. Plants*. *104, N. Ebudes; Rhum; Eigg: Canna: Sanday: J. W. H. Harrison (1939E: 106).

393/2. ARCTIUM VULGARE (Hill) A. H. Evans. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 289, as *A. nemorosum* Lej.).

[*]†395/1. CARDUUS NUTANS L. [*]H.13, Carlow; casual on roadside waste verge, Ballyellen near Goresbridge, 1941, 1942, also on sand dump by roadside near Sligoff, 1944, a rare casual in these parts—(gone from the locality noted in 1942 as road-mending material was dumped on the three plants before seed was formed), Miss E. RAWLINS.

*395/2b. CARDUUS CRISPUS L. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 289).

395/2b×1. CARDUUS CRISPUS L. × NUTANS L. 65, N.W. Yorks.; by the Swale at Thornton Bridge, near Helperby, 1944, E. C. WALLACE.

395/3. CARDUUS PYCNOCEPHALUS L. 3, S. Devon; established at Prince Rock, Plymouth, 1942, a new station about 1¼ miles east of the original station on Plymouth Hoe: also, one plant on air-raid debris in Plymouth, 1943, E. M. PHILLIPS.

395/3(2). CARDUUS TENUIFLORUS Curt. 3, S. Devon; abundant on air-raid debris, Plymouth, 1943, E. M. PHILLIPS. 17, Surrey; near a defence ditch on Banstead Downs, 1943, J. R. WALLIS.

396/1. CIRSIUM ERIOPHORUM (L.) Scop. 36, Heref.; summit of Bradlow Knoll near Ledbury, 1941: field in Eastnor Park, 1944, both shown me by W. G. GREAVES, A. J. WILMOTT.

396/1×2. **Cirsium eriophorum** L. × **vulgare** (Savi) Airy Shaw. 7, N. Wilts.; Bincknoll, 1942 (det. W. A. SLEDGE): Haugh, Winsley, 1943: J. D. GROSE (1944: *Wilts. A. and N.H.M.*, 348, as *C. eriophorum* × *lanceolatum*). 23, Oxon.; Stonepit Hills near Weston-on-the-Green, growing with an abundance of both parent species, 1943, J. P. M. BRENAN: determination confirmed by J. E. LOUSLEY who adds that the specimens are rather more on the *vulgare* side than those described by him in *Journ. Bot.*, 72, 171-173, 1934.

396/4×2. CIRSIUM ACAULE (L.) Weber ex Wigg × VULGARE (Savi) Airy Shaw =× C. SABAUDUM Löhr. 6, N. Som.; on bare oolitic pasture at the summit of Creech Hill, S.E. of Evercreech, c. 600′, 1941, N. Y. SANDWITH and A. H. G. ALSTON, det. W. A. SLEDGE (and see *Plant Notes*).

396/4b. CIRSIUM ACAULE (L.) Weber. var. CAULESCENS (Pers.) DC. 47, Mont.; Montgomeryshire side of Llanymynech Hill, 1943, Miss A. G. COOK, comm. NAT. MUS. WALES.

396/5×9. CIRSIUM DISSECTUM (L.) Hill × PALUSTRE (L.) Scop. 34, W. Glos.; damp field between Hill and Rockhampton, 1943, E. NELMES.

396/8×2. CIRSIUM ARVENSE (L.) Scop. × VULGARE (Savi) Airy Shaw. 24, Bucks.; a weed in garden at Turville Park, one plant in 1942, not reappearing in 1943, Miss D. HILLCOAT, comm. A. J. WILMOTT.

*†397/1. ONOPORDUM ACANTHIUM L. *88, M. Perth; waste ground, Aberfeldy, 1941, Miss E. S. TODD.

*†399/1. SILYBUM MARIANUM (L.) Gaertn. 34, W. Glos.; in a chicken-run at Downend, Horsley, 1941, not reappearing in 1942 or 1943, G. C. POWNALL. 41, Glam.; garden weed, Peterston-super-Ely, 1944, E. VACHELL. *47, Mont.; several plants about houses 2 miles south-east of Welshpool, and Careghofa, J. A. Webb (Wade and Webb, 1943: 62).

*401/1. SAUSSUREA ALPINA (L.) DC. 70, Cumb.; on the steep slope of a ghyll close to Esk House, at about 2000 ft., 1914, J. W. HAINES. *73, Kirkc.; cliffs near the summit of the Merrick, 1935, J. E. RAVEN—drawn, but a voucher specimen would be welcome—ED.

402/1. SERRATULA TINCTORIA L. 64, M.W. Yorks.; Walkingham Hill, near Farnham, 1943, E. C. Wallace (*Nat.*, 1944: 19). H.12, Wexford; New Ross, 1940-44, Miss E. RAWLINS.

*405/8. CENTAUREA OBSCURA Jord. *103, M. Ebudes; Tiree and Coll, J. W. H. Harrison *et al.* (1941C: 290).

*405/11. CENTAUREA NEMORALIS Jord. *103, M. Ebudes; Tiree, Coll, and Gunna, J. W. H. Harrison *et al.* (1941C: 290). *104, N. Ebudes; J. W. H. Harrison (1939E: 107).

405/12. Centaurea Cyanus L. 17, Surrey: a handsome variant with pale almost white ray florets, plentiful in field of flax, near Nutfield, 1943, J. E. Lousley and E. J. Bunnett.

†405/19. Centaurea montana L. 47, Mont.; garden outcast, Guilsfield and Bont Dolgadfan, J. A. Webb (Wade and Webb, 1943: 62).

†405/32. Centaurea melitensis L. 41, Glam.; near Horton Gower, 1944, Miss P. Simons—" sent as *C. solstitialis*," which had some years ago been recorded from the locality," comm. E. Vachell.

*415/1. Picris echioides L. *47, Mont.; roadside west of Llanbrynmair, 1 mile north of Cemmaes and near Cwm Llinau, J. A. Webb (Wade and Webb, 1943: 62). *H.13, Carlow; weed, Carrigduff near Newtownbarry, 1942, Miss E. Rawlins.

*416/1. Crepis mollis Asch. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 107).

416/3. Crepis biennis L. 17, Surrey; Tot Hill, Headley, 1943, J. E. Lousley and J. A. Whellan.

*416/10. Crepis taraxacifolia Thuill. *47, Mont.; Velindre to Pantyffridd and Careghofa, J. A. Webb (Wade and Webb, 1943: 62).

*†419/8. Hieracium brunneo-croceum Pugsl. 3, S. Devon; Plympton St Mary, 1942, E. M. Phillips. *47, Mont.; Llandinam, Meifod, Leighton, Llanfechain and Derwenlas, J. A. Webb (Wade and Webb, 1943: 62): churchyard at Montgomery, 1943, J. Bedford, det. H. W. Pugsley, comm. A. J. Wilmott.

419/50. Hieracium Schmidtii Tausch. 67, Northumb. S.; rocks near Swinburn Castle just above the stream, new county record, J. W. H. Harrison (1942: *Vasc.*, *27*, 7).

419/96. Hieracium exotericum Jord. 47, Montg.; railway bank near Forden, 1943, J. Bedford, comm. A. J. Wilmott, det. H. W. Pugsley.

419/125. Hieracium Laohenalii Gmel. 34, W. Glos.; Eden's Hill, Upleadon: 36, Heref. and 37, Worcs.; on Malvern Hills, both sides of the Wych: 1943, F. M. Day, det. H. W. Pugsley. 47, Montg.; on the Long Mountain near Leighton: rocks below Montgomery Castle; both 1943, J. Bedford, comm. A. J. Wilmott, det. H. W. Pugsley.

419/131. Hieracium subamplifolium (Zahn) Roffey. 34, W. Glos.; Pool Hill, Pauntley, 1943, F. M. Day, det. H. W. Pugsley.

419/188. Hieracium prenanthoides Vill. 64, M.W. Yorks.; limestone rocks by the Nidd, near Goydon Pot, Lofthouse, 1944, E. C. Wallace.

419/217b. HIERACIUM TRIDENTATUM Fr., var. POLYPHYLLUM Zahn. 4, N. Devon; Bampton Down, A. L. Still, det. H. W. Pugsley (*Trans. Devon Ass. Adv. Sci.*, *75*, 59: 1943).

419/239. HIERACIUM STRICTUM Fr. 103, M. Ebudes; Coll. J. W. H. Harrison *et al.* (1941C: 290).

419/241. HIERACIUM UMBELLATUM L. 47, Montg.; near Llangurig, 1943, J. BEDFORD, conf. H. W. PUGSLEY, comm. A. J. WILMOTT.

*422/3. LEONTODON LEYSSERI (Wallr.) Beck. *47, Mont.; near Brynderwen Bridge and Dolforwyn, J. A. Webb (Wade and Webb, 1943: 62). 104, N. Ebudes; Eigg: Canna: Sanday: J. W. H. Harrison (1939E: 107, as *Leontodon taraxacoides* Lacaita).

*423/15. TARAXACUM PALUSTRE (Lyons) DC. *47, Mont.; Kerry Moors near the Devil's Elbow, Dolfor, J. A. Webb (Wade and Webb, 1943: 62).

†425/1. LACTUCA VIROSA L. 30, Beds.; Great North Road, Stotfold, 1943, where it had been found some years previously by T. A. DYMES, H. and D. MEYER, and J. G. DONY.

427/3×2. SONCHUS ASPER Hill. × S. OLERACEUS L. 104, N. Ebudes; Rhum, "what appeared to be this hybrid," J. W. H. Harrison (1944: *Vasc.*, *29*, 6, as *S. oleraceus* L. × *S. asper* Hill.).

427/3c. SONCHUS ASPER Hill. var. PUNGENS Bisch. 47, Mont.; Berriew, J. A. Webb (Wade and Webb, 1943: 62).

427/3d. SONCHUS ASPER Hill. var. GLANDULOSUS (Coss.) Druce. 47, Mont.; Aberbechan, J. A. Webb (Wade and Webb, 1943: 62).

427/4e. SONCHUS OLERACEUS L. var. RUNCINATUS Coss. & Germ. 47, Mont.; Berriew. J. A. Webb (Wade and Webb, 1943: 62).

*428/2. TRAGOPOGON PRATENSIS L. 16, W. Kent; Kidbrooke Camp, 1943, J. A. WHELLAN, teste J. E. LOUSLEY. 30, Beds.; Great North Road, Stotfold, 1943, some quantity of fine specimens of the type plant, not var. *minor* (Mill), which is usual in this area, J. G. DONY. *H.12, Wexford; Newtownbarry, 1942, Miss E. BOOTH, comm. Miss E. RAWLINS.

432/1. JASIONE MONTANA L. 34, W. Glos.; near Redbrook, 1942, S. G. CHARLES, comm. W. R. PRICE.

*433/1. WAHLENBERGIA HEDERACEA (L.) Rchb. 16, W. Kent; two good patches in a heathy valley in Bedgebury Forest, 1944, the first Kent record for about 80 years, and hitherto unknown in the Weald of Kent; likely, however, to be found on the acid forest country of the Tunbridge Wells Sands, although the nearest Sussex station is near Frant, 8 or 9 miles away, F. ROSE. 34, W. Glos.; pond below Speech

House, 1944, S. G. Charles, comm. W. R. Price—appears to grow in a small area south of Speech House, but has not been seen for so many years that it was thought to be extinct. *H.11, Kilkny.; boggy field near Tullagher, 1940-44, one spreading colony, Miss E. Rawlins, det. R. Ll. Praeger.

[*]†434/2. Phyteuma spicatum L. [*]39, Staffs.; in shrubbery at Four Ashes Hall (near Stourbridge, Salop), Mrs Amphlett (A. J. Wilmott; 1944: *J.B.*, *80*, 135).

[*]†435/4. Campanula rapunculoides L. [*]H.7, Tipp. S.; Anner, 1942; H.12, Wexford; Stokestown, 1942-44; H.13, Carlow; Borris, 1940-44; a troublesome garden weed in all the above places, Miss E. Rawlins.

438/2×3. Vaccinium Myrtillus L. × Vitis-Idaea L. 64, M.W. Yorks.; Cardall Wood near Birk Crag, Harrogate, 1944, see *Supp. Yorks. Floras*, 1941, 74, for original record; three forms of the hybrid were seen, flowers and fruit being produced by one in some abundance, E. C. Wallace.

439/1. Oxycoccus quadripetalus Gilib. 65, N.W. Yorks.; abundant in Carr near Marton le Moor, Ripon, 1944, E. C. Wallace.

439/2. Oxycoccus macrocarpus Pursh. 70, Cumb.; in sphagnum at a tarn at Netherton, south of St Bees, 1943, C. D. Pigott, comm. A. J. Wilmott.

†452/1. Rhododendron ponticum L. 47, Mont.; naturalised, about Llwyngwern Hall and Ceinws, and between Aberangell and Cemmaes, J. A. Webb (Wade and Webb, 1943: 63).

*453/3. Pyrola minor L. *16, W. Kent; birch-pine wood near Wrotham Heath, 1944, the first certain record: in *C.F.* for v.-c. 16, but the only previous record by J. E. Little in *Gard. Chron.*, 1879: " Medway Valley, between Penshurst and Maidstone, on stiff clay "—is not certainly v.-c. 16, F. Rose. *H.11, Kilkny.; several extensive patches in woods of Dysertmore on R. Nore, 6 miles above New Ross, 1940-44, Miss E. Rawlins, det. R. Ll. Praeger.

†457/9. Limonium Suworowii (Regel) Kuntze. 6, N. Som.; tip at Ashton, Bristol, 1942, Ivor Evans (Sandwith, 1943: 365).

460/3. Primula veris L. With dark—" polyanthus "—red corolla. 33, E. Glos.; open grassy part of Oakley Park, Circencester, 1942, E. Nelmes.

*463/4. Lysimachia Nummularia L. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 291).

463/5. Lysimachia nemorum L. 35, Mon.; a form with cream-coloured flowers, The Forest, Llangibby, 1943, A. E. Wade.

†463/7. Lysimachia terrestris (L.) Britt., St., & Pogg. 69, Westm.; marshy field, south of Bowness: lakeside, Ambleside, both 1943, R. C. L. Burges (as *L. stricta* Ait.).

*466/1. Glaux maritima L. *47, Mont.; Dovey Junction, J. A. Webb (Wade and Webb, 1943: 63).

467/2c. Anagallis arvensis L. var. carnea Schrank. 54, N. Lincs.; Great Steeping Aerodrome, 1943, D. McClintock.

467/2f. Anagallis arvensis L. var. azurea Wilmott. 35, Mon.; fields under cultivation previous year, Warfields, Staunton Road, Monmouth, 1943, R. Lewis (as var. *coerulea*).

*468/1. Centunculus minimus L. 16, W. Kent; abundant in a ride in Bedgebury Forest, 1944, F. Rose. *H.12, Wexford; in abundance on the shore of Lady's Island Lake, 1942, Miss E. Rawlins. H.13, Carlow; sandy spot near tiny stream, near Glynn, 1942, Miss E. Rawlins, det. R. Ll. Praeger.

469/1. Samolus Valerandi L. 61, S.E. Yorks.; Houghton Wood, Yorks. Nat. Union Excursion (*Nat.*, 1944: 19). 64, M.W. Yorks.; in two places on Farnham Mires near Knaresborough, 1943, E. C. Wallace (see *Nat.*, 1944: 19).

†470/1. Syringa vulgaris L. 47, Mont.; naturalised in hedges at Carno, J. A. Webb (Wade and Webb, 1943: 63).

472/1. Ligustrum vulgare L. 36, Heref.; the dominant and dense undergrowth over many acres in Conigree Wood, Ledbury, such as I have seen nowhere else, 1944, A. J. Wilmott.

472/1c. Ligustrum vulgare L. var. auriflorum Hoefk. 7, N. Wilts.; foot of limestone cliff between Alderton and Luckington, 1944, J. D. Grose, det. Dr R. Melville. One bush only was found, associated with many white-flowered bushes. The station is remote from any house, and the form is, to all appearance, a native one. (See *Plant Notes*.)

†473/1. Vinca major L. 47, Mont.; Fron, etc., J. A. Webb (Wade and Webb, 1943: 63).

†474/2. Buddleia Davidi Franchet. 44, Carm.; waste ground, Bynea and Carmarthen, 1944, J. A. Webb, comm. Nat. Mus. Wales.

*478/4. Centaurium pulchellum (Sw.) Druce. 30, Beds.; Marston Thrift, 1943, V. H. Chambers and J. G. Dony: West Wood, Knotting, 1944, J. G. Dony. *35, Mon.; wheat-field, Llanolway, Llandenny, 1943, Miss Iris Harthy, comm. Nat. Mus. Wales.

478/7. Centaurium capitatum (Willd. ex Cham.) Britten & Rend. 41, Glam.; in turf, about 700 ft. alt., Cefn On, Llanishen, 1944 (" one dwarf compact plant, with stamens from base of corolla-tube "), E. Vachell.

*479/1. Cicendia pusilla Griseb. *110, O. Hebr.; Fuday and S. Uist, single specimens, J. W. H. Harrison (1941B: 249).

480/6. Gentiana anglica Pugsl. 7, N. Wilts.; a flesh-coloured form on Overton Down, 1942, J. D. Grose: (*Rep. Marlb. Coll. N.H.S.*, No. 92 (1944), 11; also J. D. Grose; 1944: 348).

480/9b. Gentiana campestris L. var. baltica (Murb.) Druce. 103, M. Ebudes; Coll and Gunna, J. W. H. Harrison *et al.* (1941C: 291: the variety not previously recorded for the vice-county). 104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 109, as *G. baltica* Murb.).

*482/1. Nymphoides peltata (Gmel.) Britt. & Rend. *39, Staffs.; canal between Forton and Oulton, 1944, E. S. Edees. †41, Glam.; Glamorganshire canal at Whitchurch, 1943, increasing enormously 1944, fully naturalised in the canal for some distance, originating from a lily-pond in a garden near the canal, E. Vachell (as *Limnanthemum Nymphoides* (L.)).

†490/2. Omphalodes verna Moench. 50, Denb.; in a glen near Llangollen, seen yearly in fair quantity since 1937; clearly originally planted but now well established, J. A. Whellan.

491/2. Cynoglossum germanicum Jacq. 30, Beds.; Woolton Wood, 1942, J. G. Dony.

†493/2. Lappula echinata Gilib. 16, W. Kent; Beckenham Place Park, 1934, E. J. Bunnett, det. J. E. Lousley.

*497/1. Symphytum officinale L. *104, N. Ebudes; Canna, J. W. H. Harrison (1939E: 109).

*497/2. Symphytum tuberosum L. *47, Mont.; wet shaly bank, Montgomery, J. A. Webb, 1940 (Wade and Webb, 1943: 63). *71, Mon.; Castletown, near the big meadow, 1943, C. I. Paton, comm. A. J. Wilmott.

†497/3. Symphytum orientale L. 55, (Rutland); Lyddington, 1943, A. E. Wade, comm. Nat. Mus. Wales.

†497/4. Symphytum peregrinum Ledeb. 47, Mont.; not infrequent on waste ground, riversides and lanesides, Carno, Newtown, etc., J. A. Webb (Wade and Webb, 1943: 63): roadside between Llanymynech and Llansantffraid, 1942, J. W. Gough and N. Y. Sandwith.

†498/1. BORAGO OFFICINALIS L. 20, Herts.; Grove Farm, Markyate, 1943, J. G. DONY. 47, Mont.; two or three plants in a hedge near houses, Arddleen, J. A. Webb (Wade and Webb, 1943: 63).

*500/1. ANCHUSA SEMPERVIRENS L. *7, N. Wilts.; Treacle Bolly; *8, S. Wilts.; Burbage, both [L. G. Peirson] 1943 (*Rep. Marlb. Coll. N.H.S.*, No. 92 (1944), 11; also J. D. Grose; 1944: 348). †33, E. Glos.; roadside, Fish Hill, Broadway, 1944, Mrs A. B. LANE, comm. by W. R. PRICE. *47, Mont.; rather frequent, Aberbechan, Kerrydale, Montgomery, Llanllwchaiarn, Arddleen, Four Crosses, Snead and Derwenlas, J. A. Webb (Wade and Webb, 1943: 63).

*†503/1. PULMONARIA OFFICINALIS L. *47, Mont.; among nettles and on rubble at Llanllugan, bank at Bont Dolgadfan, J. A. Webb (Wade and Webb, 1943: 63).

*506/2. MYOSOTIS BREVIFOLIA C. E. Salmon. *63, S.W. Yorks.; Pecket near Hebden Bridge, 1943, H. Walsh (*Nat.*, 1944: 19).

506/3. MYOSOTIS SECUNDA A. Murray. 16, W. Kent; near Lamberhurst, 1943, J. R. WALLIS (as *M. repens* G. & D. Don). 104, N. Ebudes; new to Rhum, very often with white flowers, Harrison *et al.* (1944: 115, as *M. repens* G. & D. Don).

*506/7. MYOSOTIS SYLVATICA (Ehrh.) Hoffm. 33, E. Glos.; in copses and ditches, truly native and plentiful, Tirle Brook, Woolstone, 1944, C. W. BANNISTER, comm. W. R. PRICE. *47, Mont.; Leighton, not native, borders of meadows at Pennant, Llanllugan, abundant and looking native in Gregynog Woods, J. A. Webb (Wade and Webb, 1943: 63).

506/10c. MYOSOTIS VERSICOLOR Sm. var. DUBIA (Arrond.) Rouy. 39, Staffs.; Madeley and Wrinehill Wood, 1943, E. S. Edees, det. A. E. Wade (1944: *Trans. N. Staffs. Field Club*, 78, 51).

*507/2. LITHOSPERMUM PURPUREO-CAERULEUM L. *35, Mon.; edge of a wood, Carrow Hill, 1944, Mrs J. C. ELLIS, comm. NAT. MUS. WALES.

[*]†507/3. LITHOSPERMUM ARVENSE L. [*]47, Mont.; two plants on road metal chippings near Forden Union, J. A. Webb (Wade and Webb, 1943: 63). 110, O. Hebr.; Lewis, J. W. H. Harrison (1941B: 250) —confirms " Hebrides; Balfour and Babington " in *Top. Bot.*, ed. 2, and citation of 110 in *C.F.*—ED.

*513/1. CONVOLVULUS ARVENSIS L. *110, O. Hebr.; Vatersay, amongst rye, J. W. H. Harrison (1941B: 250).

513/1d. CONVOLVULUS ARVENSIS L. var. OBTUSIFOLIUS Choisy. 47, Mont.; Newtown, J. A. Webb (Wade and Webb, 1943: 64).

515/2. Cuscuta europaea L. 30, Beds.; Harrold Bridge, 1943, abundant, J. G. Dony and B. Verdcourt: Leighton Buzzard, 1943, just beginning to spread, B. Verdcourt: Milton Ernest, 1944, J. G. Dony.

*515/3. Cuscuta epithymum (L.) Murray. 30, Beds.; Rushmere, Heath and Reach, 1944, E. Milne-Redhead and J. G. Dony. *35, Mon.; near Roggiett, 1942, Mrs J. C. Ellis, comm. Nat. Mus. Wales. *66, Durham; on gorse, edge of Egglestone Moor, J. W. H. Harrison (1942: *Vasc.*, *27*, 16). *H.12, Wexford; Lady's Island, 1942, Miss E. Rawlins.

515/4. Cuscuta Trifolii Bab. 30, Beds.; Harrold, 1944, Miss G. H. Day, comm. J. G. Dony.

*517/2. Solanum nigrum L. 3, S. Devon; air-raid debris, Plymouth, 1943, E. M. Phillips. *H.11, Kilkny.; garden weed, Goresbridge, 1942, Miss E. Rawlins.

†518/1. Physalis Alkekengi L. 44, Carm.; Hendy, 1944, J. A. Webb, comm. Nat. Mus. Wales.

519/1. Nicandra physaloides Gaertn. 13, W. Suss.; in considerable quantity in a small derelict garden near Brighton railway station, also one fine plant 50 yards away, 1941, 1942: the garden is now in cultivation again, L. A. W. Burder, det. at Kew.

520/2. Lycium halimifolium Mill. 47, Mont.; occasionally naturalised in hedgerows, Newtown, Welshpool, Kerry, Montgomery and Four Crosses, J. A. Webb (Wade and Webb, 1943: 64). 50, Denb.; Kinmel Bay, 1943, J. A. Webb, comm. Nat. Mus. Wales.

521/1. Atropa Belladonna L. 21, Middx.; grounds of the West Middlesex County Hospital, Isleworth: grounds of Syon House, Isleworth: old chalk pit at rear of Asbestos Works at Harefield, several plants; all 1944, D. H. Kent.

522/1. Datura Stramonium L. 7, N. Wilts.; Old Swindon and West Kennett, 1943 (*Rep. Marlb. Coll. N.H.S.*, No. 92 (1944), 11). 8, S. Wilts.; Donhead St Mary, A. E. A. Dunston (J. D. Grose; 1944: 348). 17, Surrey; garden weed, rather plentifully at Petersham, 1943-44, J. A. Whellan. 25, E. Suff.; a few plants in waste ground at Bixley Heath, 1944, J. A. Whellan.

*527/4. Verbascum virgatum Stokes. 3, S. Devon; Peverell, Plymouth, 1943, E. M. Phillips. 34, W. Glos.; about half way between Ryton and Ketford Bridge, 1914 and 1915, shown to H. J. Riddelsdell, who thought it might be native there, J W. Haines (see *1941-42 Rep.*, 497). *45, Pemb.; on shale of an abandoned coal mine 1 mile from Saundersfoot, 1943, Mrs F. L. Rees, comm. Nat. Mus. Wales.

*†527/7. VERBASCUM LYCHNITIS L. *33, E. Glos.; waste ground, Walham, Gloucester, 1942, Rev. R. B. ABELL.

527/8. VERBASCUM NIGRUM L. 41, Glam.; white- and yellow-flowered plants at Cowbridge, Hon. G. Charteris (*Trans. Cardiff N.S.*, *71*, 31).

†527/11. VERBASCUM SINUATUM L. 28, W. Norf.; spontaneous in gardens at Thetford, 1943, H. D. HEWITT, det. and comm. J. L. LOUSLEY.

532/1. LINARIA VULGARIS Mill. H.11, Kilkny.; a few plants near Bagenalstown, 1940-44, Miss E. RAWLINS.

532/1×3. LINARIA REPENS (L.) Mill. × VULGARIS Mill. 12, N. Hants.; railway embankment, Sutton Scotney, 1940 (confirmed by P. M. HALL), Hon. W. J. L. PALMER. 44, Carm.; Morfa, Kidwelly, 1944, J. A. WEBB, comm. NAT. MUS. WALES.

†532/2. LINARIA PURPUREA (L.) Mill. 7, N. Wilts.; escape, Bath Road, Marlborough, 1943 (*Rep. Marlb. Coll. N.H.S.*, No. 92 (1944), 11); also Kingsdown (J. D. Grose; 1944: 348). 50, Denb.; Penasarn; Maerdy; near Valle Crucis, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

*532/3. LINARIA REPENS (L.) Mill. *47, Mont.; railway track, Llanidloes, Penegoes, and Cemmaes, J. A. Webb (Wade and Webb, 1943: 64). *50, Denb.; Cerrig-y-Druidion, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

*532/7. LINARIA MINOR (L.) Desf. *47, Mont.; fairly general and almost confined to railway tracks, Breidden to Derwenlas and from Llanfyllin to Tylwch, Glanyrafon, Commins Coch and Talerddig, J. A. Webb (Wade and Webb, 1943: 64).

*532/24. LINARIA SPURIA (L.) Mill. *36, Heref.; abundant in field inside the " vallum " and also in field below the wood, Wall Hill, near Ledbury, 1944, virtually new to the county, the plant being long extinct in the only locality given by Purchas & Ley (1889: *Fl. Heref.*, 212); remove from brackets in *C.F.*, A. J. WILMOTT.

[*]532/25. LINARIA ELATINE (L.) Mill. 36, Heref.; abundant in field inside the " vallum," and also in field below the wood, Wall Hill, near Ledbury, 1944, A. J. WILMOTT. [*]†H.11, Kilkny.; railway verge near New Ross, casual, 1942, Miss E. RAWLINS.

†534/1. ANTIRRHINUM MAJUS L. 47, Mont.; naturalised on walls at Welshpool, Montgomery, Pontdolgoch and Ystum Colwyn, J. A. Webb (Wade and Webb, 1943: 64).

[*]534/2. Antirrhinum Orontium L. 30, Beds.; Heath and Reach, 1944, J. G. Dony. [*]†H.11, Kilkny.; railway track at New Ross, casual, 1942, Miss E. Rawlins. [*]†H.12, Wexford; garden weed, Ballinastraw, Newtownbarry, 1942, Miss E. Booth, comm. Miss E. Rawlins.

†535/1. Scrophularia vernalis L. 50, Denb.; on a wall at Bettws-yn-Rhos, 1939, J. A. Whellan.

535/3. Scrophularia umbrosa Dum. 33, E. Glos.; osier bed by Severn, near Tewkesbury, very luxuriant, 1944, C. W. Bannister, comm. W. R. Price (as *S. alata* Gilib.).

535/4b. Scrophularia nodosa L. var. Bobartii Pryor. 7, N. Wilts.; Chisbury Wood, 1943 (*Rep. Marlb. Coll. N.H.S.*, *No. 92* (1944), 11)—near Marlborough, L. G. Peirson (J. D. Grose; 1944: 349).

*†537/1. Mimulus guttatus DC. *H.12, Wexford; hedge-ditch by roadside near Stokestown, 1944, Miss E. Rawlins. *H.13, Carlow; stream side near Poulmonty, 1940-44: also in stream at S. Mullins (on Barrow): Miss E. Rawlins.

†537/2. Mimulus moschatus Dougl. 12, N. Hants; established in one place by the R. Enborne near Newbury, 1944, H. Wheeler, comm. A. J. Wilmott. 42, Brecon; banks of Esgryn Brook between Hay and Capel-y-ffin, 1944, S. G. Charles, comm. R. Lewis.

539/1. Limosella aquatica L. 30, Beds.; Drakelow Pond, Woburn Park, 1944, J. G. Dony.

543/4. Veronica Chamaedrys L. 33, E. Glos.; with almost white flowers, roadside, Colesborne, 1941, E. Nelmes. 110, O. Hebr.; Barra, J. W. H. Harrison (1941B: 251)—not in *Top. Bot.* or *Supps.* but given for 110 in *C.F.*—Ed.

543/5. Veronica montana L. 20, [Beds.]; Elm Grove, Studham; 1941; J. G. Dony. 30, Beds.; Arden Dells, East Hyde, 1941: Battlesden; 1942, V. H. Chambers and J. G. Dony: Aspley Wood, 1943, V. H. Chambers.

543/6b. Veronica scutellata L. var. villosa Schum. 65, N.W. Yorks.; Pillmore Carr near Sharrow, 1943, E. C. Wallace.

543/12. Veronica humifusa Dickson. 98, Argyll M.; Meall Buidhe, Achallader, 1943, E. C. Wallace.

*543/18. Veronica persica Poir. *47, Mont.; Llanllwchaiarn, etc., J. A. Webb (Wade and Webb, 1943: 64).

*543/20. VERONICA POLITA Fr. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 292). *104, N. Ebudes; Pabbay, J. W. H. Harrison (1939E: 110).

†543/27. VERONICA REPENS DC. 59, S. Lancs.; naturalised in lawns, Victoria Park, Nelson, A. Turner (1944: *N.W. Nat.*, *19*, 68).

†543/41. VERONICA FILIFORMIS Sm. 35, Mon.; banks of River Wye, Hadnock, near Monmouth, 1944, R. LEWIS.

545/3. EUPHRASIA BREVIPILA Burnat & Gremli. 47, Mont.; Carno and Cwm Belan, J. A. Webb (Wade and Webb, 1943: 64)—first record for v.-c. 47: upland meadow near Hirnant, 800 ft., and in hayfield at Llanwddeu, E. end of Lake Vyrnwy, 1942, J. W. GOUGH and N. Y. SANDWITH; confirmed by H. W. PUGSLEY.

545/5. EUPHRASIA NEMOROSA **(Pers.) Löhr.** 14, E. Suss.; Saxonbury Wood, 1943, J. R. WALLIS, det. H. W. PUGSLEY. 16, W. Kent; Rear Wood near Bayham, 1943, J. R. WALLIS, det. H. W. PUGSLEY.

545/5c. EUPHRASIA NEMOROSA (Pers.) Löhr. var. CALCAREA Pugsl. 17, Surrey; downs above Chipstead, 1943, J. R. WALLIS, det. H. W. PUGSLEY.

545/5d. EUPHRASIA NEMOROSA (Pers.) Löhr. var. COLLINA Pugsl. 64, M.W. Yorks.; Quarry Moor, Ripon, Farnham Mires and Burton Leonard, 1943, E. C. WALLACE.

545/16. EUPHRASIA SCOTICA Wettst. 69, Westm.; bog, Fellfort, Langdale, 1943, R. C. L. BURGES, det. H. W. PUGSLEY. 98, Argyll M.; roadside, Inveroran, Loch Tulla, 1943, R. MACKECHNIE and E. C. WALLACE. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 292).

545/18. EUPHRASIA CONFUSA Pugsley. 69, Westm.; hillside, Dungeon Gill, Langdale, 1943, R. C. L. BURGES, det. H. W. PUGSLEY (as f. *albida*). 104, N. Ebudes; shore at Dornoch, Skye, 1938, J. E. LOUSLEY ("the unbranched Scottish form of f. *albida*"), det. H. W. PUGSLEY.

545/19. EUPHRASIA ROSTKOVIANA Hayne. 69, Westm.; meadow above Loughrigg Tarn, 1943, R. C. L. BURGES, det. H. W. PUGSLEY.

545/19(3). EUPHRASIA RIVULARIS Pugsley. 69, Westm.; grassy bank at foot of Langdale Pikes above Stickle Tarn, 1943, R. C. L. BURGES, det. H. W. PUGSLEY.

545/19(4). EUPHRASIA ANGLICA Pugsl. 14, E. Suss.; field near the High Rocks, 1943, H. W. PUGSLEY and J. R. WALLIS. 16, W. Kent; field near Bayham, 1943, J. R. WALLIS, det. H. W. PUGSLEY.

*548/1. RHINANTHUS MAJOR Ehrh. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 293). *110, O. Hebr.; Vatersay, J. W. H. Harrison (1941B: 252).

*548/5. RHINANTHUS STENOPHYLLUS Schur. 62, S.E. Yorks.; turfy ground in clay pit, Tollerton Forest; 64, M.W. Yorks.; roadside near Moorcock Hall, Darley, 1944, E. C. WALLACE. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 293).

548/5(2). RHINANTHUS CALCAREUS Wilmott. 7, N. Wilts.; near Clyffe Hanging (J. D. Grose; 1944: 349). 8, S. Wilts.; Thirteen Hundred Down: Casterley Camp (J. D. Grose; 1944: 349). [Delete H.15, Galw. S.E.; see *B.E.C. 1939-40 Rep.*, 368. Dr W. A. Sledge states that it was collected by him and N. Douglas Simpson in one locality only, which was in H.9, Clare.—A. J. WILMOTT.]

*548/6. RHINANTHUS SPADICEUS Wilmott. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 293, as *R. monticola*). *104, N. Ebudes; Fionchra and Rhum, J. W. H. Harrison (1939E: 111, as *R. monticola* Druce).

548/7. RHINANTHUS BOREALIS (Stern.) E. S. Marshall. 98, Argyll M.; various places on the hills from Ben Douran to Ben Chreachain, 2500′-3000′, 1943, R. MACKECHNIE and E. C. WALLACE.

548/8. RHINANTHUS "DRUMMOND-HAYI (Stern.) Druce." 104, N. Ebudes; Fionchra: Rhum: Eigg, J. W. H. Harrison (1939E: 111)—will be N.C.R. when identified, but see *B.E.C. 1939-40 Rep.*, 373 *seq.* —Ed.

*549/5. MELAMPYRUM SYLVATICUM L. *98, Argyll M.; rock ledge on Meall Buidhe, Achallader, alt. 2000′, 1943, E. C. WALLACE.

*550/7. OROBANCHE HEDERAE Duby. *7, N. Wilts.; Blunsdon Abbey ruins, 1943, J. D. GROSE (1944: *Wilts. A. and N.H.M.*, 349).

550/10. OROBANCHE MINOR Sm. 14, E. Suss.; on a recently constructed roadside bank near Eridge Station, 1943, a rare plant in this part of the county, J. R. WALLIS. 34, W. Glos.; roadside, Minchinhampton, towards Longfords, one plant, 1943, G. C. POWNALL.

*551/1. LATHRAEA SQUAMARIA L. *H.12, Wexford; Newtownbarry, Miss E. BOOTH, comm. Miss E. RAWLINS.

*552/2. UTRICULARIA NEGLECTA Lehm. *25, E. Suff.; Cooper's Farm, Blythburgh, 1880, Miss JULIA GRUBBE—the specimen was discovered by Miss M. M. WHITING in a small collection which Miss Margaret Grubbe (niece of Miss Julia) has recently presented through her to the Kew Herbarium—comm. N. Y. SANDWITH: add to *C.F.* but see *Top. Bot.*

Suppl. 1 for previous record—Ed. *49, Carn.; abundant, flowering sparingly, in Ystumllyn, near Criccieth, 1943, J. A. WHELLAN (as *U. major* Schmidel.).

552/5. UTRICULARIA MINOR L. 98, Argyll M.; flowering freely in pools on Rannoch Moor about Loch Ba, 1943, R. MACKECHNIE and E. C. WALLACE.

*553/2. PINGUICULA VULGARIS L. *15, E. Kent; bog on Hothfield Heath, 1943, F. ROSE (see *J.B.*, *80*, 135). H.13, Carlow; Ardristan bog near Tullow, 1942, Miss E. RAWLINS.

†554/2. **Acanthus spinosissimus** Pers. 34, W. Glos.; on a ballast heap outside Bristol, 1942, comm. Keeper of Botany, Nat. Mus. Wales, det. at Kew (Sandwith, 1943: 365).

556/1. VERBENA OFFICINALIS L. 61, S.E. Yorks.; Kexby Bridge, river Derwent, 1944, E. C. WALLACE.

*558/1. MENTHA ROTUNDIFOLIA (L.) Huds. *47, Mont.; Newtown, near Machynlleth, Llanmerewig and near Melinddol, J. A. Webb (Wade and Webb, 1943: 64). *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 293). H.13, Carlow; Borris, Graigue-na-managh: and other spots: 1940-44, Miss E. RAWLINS.

*558/2. MENTHA ALOPECUROIDES Hull. 20, Herts.; Sarratt Bottom, 1943; 36, Heref.; junction of Brock Hill Road and Purlieu Lane: Mathon: both 1943, F. M. DAY, det. A. L. STILL. *44, Carm.; Llwynhendy: Rhydowen: Pwll: Hendy: all 1944, J. A. WEBB, comm. NAT. MUS. WALES.

*558/3. MENTHA LONGIFOLIA (L.) Huds. 33, E. Glos.; near The Boys' Home, Painswick, 1943, F. M. DAY, det. A. L. STILL. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 293).

*558/4. MENTHA SPICATA L. 37, Worcs.; old Brick Pits, Upton-on-Severn, 1943, F. M. DAY, det. A. L. STILL. *†47, Mont.; near Llandinam Glen and Tylwch, J. A. Webb (Wade and Webb, 1943: 64). 64, M.W. Yorks.; Blubberhouses, ditch on Harrogate road, 1943, E. C. Wallace (see *Nat.*, 1944: 19). †65, N.W. Yorks.; by stream near Snape, 1944, E. C. WALLACE.

*558/6. MENTHA PIPERITA L. 64, M.W. Yorks.; ditches in lane near Birstwith, and near Huby: both 1943, E. C. Wallace (see *Nat.*. 1944: 19). *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 293). †H.12, Wexford; lanes near Lady's Island, 1942, Miss E. RAWLINS.

558/6. MENTHA PIPERITA L. lusus *pilosus*. 64, M.W. Yorks.; ditch in lane, Huby near Weeton: ditch in lane near Aldborough, this latter plant recorded in *Supp. Yorks. Flora's*, 1941, 86, as *M. aquatica* × *piperita*: both 1943, E. C. WALLACE.

558/6a. **Mentha piperita** L. var. **officinalis** (Sole). 36, Heref.; Moorcroft, Colwall, 1943, F. M. Day.

558/6d. **Mentha piperita** L. var. **subcordata** Fraser. 35, Mon.; banks of small stream, Botany Bay, above Tintern Parva, 1943, R. Lewis, det. A. L. Still. 64, M.W. Yorks.; by stream at Beckwithshaw, 1943, E. C. Wallace (*Nat.*, 1944 : 18).

558/7d. **Mentha aquatica** L. var. **capitata** (Opiz) Briq. 3, S. Devon; Chudleigh Knighton, Heathfield, Hennock, F. M. Day, det. A. L. Still.

558/9. ×**Mentha verticillata** L. 35, Mon.; grass verge, roadside, Trelleck, 1943, R. Lewis, det. A. L. Still, who writes, "Topitz figures a similar form as var. *latissima* Strail." 36, Heref.: roadside, Ridgway Cross to Frome's Hill, Cradley, whorls beginning to be subspicate, 1943, F. M. Day—"This seems to be var. *serotina* (Host.) Top. Topitz includes this under *M. paludosa* Sole var. *serotina* (Host.) H. Br., whatever that may have been," A. L. Still.

558/9e. **Mentha verticillata** L. var. **ovatifolia** H. Braun. 3, S. Devon; Teigngrace, 1943, F. M. Day, det. A. L. Still. 30, Beds.; Melchbourne, 1942, J. G. Dony, det. A. L. Still.

558/9n. **Mentha verticillata** L. var. **rubrohirta** (L. & C.) Briq. 36, Heref.; foot of Brock Hill, Colwall, 1943, F. M. Day. "Perhaps; but these almost simple ground shoots are often not typical. I have one var. *paludosa* with bracts much like those of *M. rubra*," A. L. Still.

558/9q. ×**Mentha verticillata** L. var. **rivalis** (Sole) Briq. 3, S. Devon; Chudleigh Knighton, Hennock, 1943, F. M. Day, det. A. L. Still. 36, Heref.; near Vinesend, Cradley, 1943, F. M. Day. "Leaves not oval, but obovate. I can only lump it under *rivalis*, but it is not unlike what Topitz calls var. *calaminthoides* (Host.) Top.", A. L. Still.

*558/10. ×**Mentha gentilis** L. 35, Mon.; banks of R. Wye, Hadnock, Monmouth, 1943, R. Lewis, det. A. L. Still. *47, Mont.; by the Banwy, Llanfair Caereinion, J. A. Webb (Wade and Webb, 1943 : 64) 64, M.W. Yorks.; several places by the Ure, Hackfall, and in 65, N.W. Yorks.; lower down at Tanfield, both 1943, E. C. Wallace (see *Nat.*, 1944 : 19). 65, N.W. Yorks.; by stream at Snape, 1944, E. C. Wallace.

558/11. ×**Mentha cardiaca** Baker. 64, M.W. Yorks.; gravel pits near Farnham Mires, 1943, E. C. Wallace.

558/13b. **Mentha arvensis** L. var. **obtusifolia** Briq. 35, Mon.; weed in cultivated garden, Staunton Road, Monmouth, 1943, R. Lewis, det. A. L. Still, who writes, "This agrees well with var. *obtusifolia*, Bq." 36, Heref.; Pithouse Bank, Coddington, 1943, F. M. Day—"Yes, you could call it that," A. L. Still.

558/13c. MENTHA ARVENSIS L. var. NUMMULARIA (Schreb.). 36, Heref.; Downs School garden, Colwall, 1943, F. M. DAY. "The long petioles bring it under var. *silvicola* (H. Braun) Top. He makes *nummularia* (Schreb.) a form of this, and this plant could be called that." A. L. STILL.

558/13f. MENTHA ARVENSIS L. var. PRAECOX (Sole) Sm. 36, Heref.; Colwall, 1943, F. M. DAY. "Doubtful. According to Fraser *praecox* is a subglabrous form, and Sole's sheets cover *Allionii* and probably other varieties. Topitz figures plant var. *slichoviensis* (Op.) Top. with similar prominent serratures," A. L. STILL.

558/13j. MENTHA ARVENSIS L. var. DENSIFOLIATA Briq. 36, Heref.; Pithouse Bank, Coddington, 1943, F. M. DAY, det. A. L. STILL.

558/13 l. MENTHA ARVENSIS L. var. CUNEIFOLIA Lej. 36, Heref.; Redland garden, Colwall, a single plant, leaves very narrow, 4 mm. wide by 20 mm. long, with few, if any, small serratures, whorls stalked, especially the lower ones, flowers small, 1943, F. M. DAY—"A very curious plant. The pedicels are glabrous, so I think it must be *arvensis*, and other characters agree well with those given by Fraser for var. *cuneifolia* Lej. & Court, but it is a very extreme form," A. L. STILL: Downs School garden, Colwall, leaves short-stalked, 2 cm. × 4 or 5 cm., serrations shallow and blunt, whorls scarcely stalked, 1943, F. M. DAY—"A curious plant. The very blunt and shallow serratures bring it near to *M. tenuifolia* (Host.) Top., according to Topitz's description. I don't know Host's plant," A. L. STILL.

*558/14. MENTHA PULEGIUM L. *44, Carm.; Upper Brynamman and Cwmllynfell, 1944, J. A. WEBB, comm. NAT. MUS. WALES.

*561/10. THYMUS NEGLECTUS Ronn. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 294).

*561/11. THYMUS BRITANNICUS Ronn. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 294).

*†? 563/1. CLINOPODIUM VULGARE L. *H.11, Kilkny.; large patches by roadside and field hedges, Goresbridge on Barrow, 1941-44, Miss E. RAWLINS—given for H.11 in *C.F.* but not by Dr Praeger.

*†565/1. MELISSA OFFICINALIS L. 2, E. Cornw.; Markwell, St Erney, 1943, E. M. PHILLIPS. 19, N. Essex; established plentifully in Tolleshunt d'Arcy, 1944, J. A. WHELLAN. 44, Carm.; Pwll, 1944, J. A. WEBB, comm. NAT. MUS. WALES. 46, Card.; cliffs at Newquay, plentifully, 1939, J. A. WHELLAN. *47, Mont.; Dolforwyn, Garthmyl, Milford, Careghofa and near Welshpool, J. A. Webb (Wade and Webb, 1943: 64).

566/1. Salvia pratensis L. 15, E. Kent; above Detling, C. Gray, c. 1935: near Barham Downs, 1939, B. J. Brooke and F. Rose: Boxley, Warren, 1944, C. West, comm. F. Rose.

*†573/2. Prunella laciniata L. *23, Oxon.; near Fawley associated with a wide range of forms with flowers of various colours and various leaf outlines such as have elsewhere been regarded as hybrids of this species with *P. vulgaris*, 1944, D. McClintock and W. J. L. Sladen, det. J. E. Lousley.

577/3. Stachys sylvatica L. 104, N. Ebudes; new to Rhum, Harrison *et al.* (1944: 115).

*577/4. Stachys palustris L. × sylvatica L. *65, N.W. Yorks.; near Goskins, between Leeming and Catterick Bridge, 1943, C. M. Rob (*Nat.*, 1944: 19). *103, M. Ebudes; Coll (locally common although *S. sylvatica* was absent), J. W. H. Harrison *et al.* (1941C: 294). 107, E. Suth.; waste ground by station yard, Lairg, 1943, A. J. Wilmott. *110, O .Hebr.; Barra, J. W. H. Harrison (1941B: 254).

†577/7. Stachys annua L. 17, Surrey; clover field near Greystone Limeworks, Merstham, 1943, J. E. Lousley.

*578/1. Galeopsis speciosa Mill. *34, W. Glos.; one plant, near Newland, Forest of Dean, 1942, S. G. Charles (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8). 64, M.W. Yorks.; Arkendale, 1944, E. C. Wallace.

578/2b. Galeopsis Tetrahit L. var. bifida (Boenn.) Lej. & Court. 41, Glam.; near Nash, 1940, apparently the rarer form in the vice-county, E. Vachell.

578/2c. Galeopsis Tetrahit L. var. nigricans Bréb. 47, Mont.; seems to be as frequent as the type in Montgomeryshire, J. A. Webb (Wade and Webb, 1943: 65).

†581/2. Lamium maculatum L 47, Mont.; near Cemmaes, Garthmyl, Melinddol and Uwchygarreg, J. A. Webb (Wade and Webb, 1943: 65). 64, S.W. Yorks; well naturalised away from houses by a stream near Gargrave, 1943, J. A. Whellan.

*581/4. Lamium hybridum Vill. 62, N.E. Yorks.; cult. land, Huby, near Stillington, 1944, E. C. Wallace. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 294).

*581/10. Lamium Galeobdolon (L.) Cr. *66, Durham; near Lumley Castle (1942: *Vasc.*, *27*, 7).

*583/1. Ballota nigra L. *H.13, Carlow; on old earth covered wall on roadside near Bagenalstown, 1940-44, Miss E. Rawlins.

*587/2. Ajuga pyramidalis L. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 294).

587/4. Ajuga Chamaepitys (L.) Schreb. 12, N. Hants.; cornfield, Bullington, 1944, Hon. E. Palmer, comm. W. J. L. Palmer.

*590/1. Illecebrum verticillatum L. 16, W. Kent; by rides in Bedgebury Forest, 1944, F. Rose (and cf. *B.E.C. 1920 Rep.*, 143). 22, Berks.; moist sandy track in Easthampstead Park, 1944, D. McClintock. *68, Chev.; sandy ground near the confluence of the Akenshaw and Lewis burns, Kielder area; with roundish leaves, J. W. H. Harrison (1944: *Vasc.*, *29*, 24). *110, O. Hebr.; Barra [supporting Goodrich Freer's doubted record (1903) for Eriskay], J. W. H. Harrison 1941B: 255)—add to *C.F.*, Ed.

*593/2b. Herniaria ciliata Bab. var. angustifolia Pugsl. *110, O. Hebr.; S. Uist, J. W. H. Harrison (1941B: 255), det. H. W. Pugsley. —Previously recorded by Helena H. Harrison (1940?: in *Proc. King's Coll. Agric. Students' Association*—preprint December 1939, fourth unnumbered page).—Ed.

*595/2. Scleranthus annuus L. *47, Mont.; cornfields from Cyfronydd to Maesmawr, J. A. Webb (Wade and Webb, 1943: 65). *H.13, Carlow; side of sandy by-road, Gowlin, foot of Black Stairs Mt., 1941, Miss E. Rawlins.

†596/6. Amaranthus retroflexus L. 12, N. Hants.; cultivated land, Priory Valley, Selborne, 1944 (confirmed at Kew), Hon. W. J. L. Palmer. 16, W. Kent; Warren Wood, E. Malling, 1942: near Barming Station in Hop-garden: abundant in fields south of E. Malling: two latter records 1944, possibly brought with feathers used as manure, F. Rose and C. West. 30, Beds.; Clophill, 1943, J. G. Dony, J. E. Lousley and V. H. Chambers, det. A. J. Wilmott.

†600/4. Chenopodium hybridum L. 30, Beds.; Woburn, 1942, J. G. Dony, det. J. P. M. Brenan.

600/6. Chenopodium murale L. 21, Middx.; on a bombed site, Causton Street, London, S.W.1, 1943, D. McClintock: site of bombed buildings, Church Street, Chelsea, 1943, J. E. Lousley and W. J. Sladen.

*†600/7. Chenopodium opulifolium Schrad. *110, O. Hebr.; Vatersay, J. W. H. Harrison (1941B: 255).

†600/11. Chenopodium pratericola Rydb. 58, Ches.; potato field near Oakmere, 1940, J. A. Whellan, det. at Kew (as *C. leptophyllum*).

600/12. Chenopodium ficifolium Sm. 26, W. Suff.; abundant in fields near Risby, 1944, J. A. Whellan.

*600/13. CHENOPODIUM GLAUCUM L. 19, N. Essex; plentiful in a potato field at Springfield, near Chelmsford, 1944, J. A. WHELLAN. *54, N. Lincs.; waste place by roadside near Wroot, 1943, John Brown (1944: *N.W. Nat.*, *18*, 325).

*600/15. CHENOPODIUM POLYSPERMUM L. *47, Mont.; arable land, Llanllwchaiarn, J. A. Webb (Wade and Webb, 1943: 65).

†600/21. CHENOPODIUM HIRCINUM Schrad. 3, S. Devon; Chagford, 1941, J. P. M. Brenan (*Trans. Devon Ass. Adv. Sci.*, *75*, 62: 1943). 33, E. Glos.; Fiddington, near Tewkesbury, 1944, C. W. BANNISTER, comm. W. R. PRICE, det. J. P. M. BRENAN.

*606/2. ATRIPLEX LITTORALIS L. *110, O. Hebr.; Flodday and Vatersay, J. W. H. Harrison (1941B: 255).

606/7a. ATRIPLEX GLABRIUSCULA Edmondst. var. VIRESCENS (Lange) Moss & Wilmott. 41, Glam.; Aberthaw, E. VACHELL, who adds "not mentioned in List of Glamorgan Plants, det. A. J. WILMOTT."

†606/10. ATRIPLEX HORTENSIS L. 25, E. Suff.; one plant on waste ground at Bixley Heath, 1944, J. A. WHELLAN. H.12, Wexford; in gardens and waste places at Rosslare, 1941, Miss E. RAWLINS.

*606/17. ATRIPLEX PORTULACOIDES L. *47, Mont.; salt marsh, Dovey Junction, J. A. Webb (Wade and Webb, 1943: 65).

†607/1. AXYRIS AMARANTHOIDES L. 29, Cambs.; Coton footpath, near Cambridge, 1944, Dr W. H. MILLS, comm. A. J. WILMOTT.

*611/5. SALICORNIA RAMOSISSIMA Woods. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 295). *110, O. Hebr.; Benbecula and S. Uist, J. W. H. Harrison (1941B: 256).

*611/8. SALICORNIA PROSTRATA Pallas. *110, O. Hebr.; Benbecula, J. W. H. Harrison (1941B: 256)—not seen and much doubted, A. J. WILMOTT.

†613/3. SALSOLA PESTIFER Nelson. 17, Surrey; in a field of carrot, Chipstead Valley, 1943, J. E. LOUSLEY, A. B. JACKSON and N. Y. SANDWITH.

615/3. POLYGONUM BISTORTA L. 16, W. Kent; Bedgebury, 1943, J. R. WALLIS.

615/4. POLYGONUM VIVIPARUM L. 110, O. Hebr.; new to S. Uist, Harrison *et al* (1944: 115).

615/6×7. POLYGONUM LAPATHIFOLIUM L. × PERSICARIA L. 35, Mon.; waste ground, Hadnock Cottages, Monmouth, 1943, R. LEWIS, det. C. E. BRITTON.

615/8. POLYGONUM NODOSUM Pers. 33, E. Glos.; mud, Swilgate, Tewkesbury, 1944, C. W. BANNISTER, comm. W. R. PRICE (as *P. petecticale* (Stokes) Druce).

615/9×11. POLYGONUM HYDROPIPER L. × MINUS Huds. 64, M.W. Yorks.; with the parents by pond near Copgrove, 1944, E. C. WALLACE.

615/10. POLYGONUM MITE Schrank. 35, Mon.; banks of R. Wye, Hadnock, Monmouth, 1943, R. LEWIS, det. C. E. BRITTON. 41, Glam.; wide ditch, Ely, plentiful, 1944, confirmation of old record, see *Phytol.*, 1842 and 1843, E. VACHELL.

615/10×7. POLYGONUM MITE Schrank × PERSICARIA L. 35, Mon.; banks of R. Wye, Hadnock, Monmouth, 1943, S. G. CHARLES, comm. R. LEWIS, det. C. E. BRITTON.

615/11. POLYGONUM MINUS Huds. 34, W. Glos.; two plants among much *P. Hydropiper*, near Parkend, 1942, S. G. CHARLES, comm. W. R. PRICE. 49, Carn.; abundant on borders of Ystumllyn, near Criccieth, 1943, J. A. WHELLAN, det. J. E. LOUSLEY. 65, N.W. Yorks.; Newby Wiske Carr, and pond at Berryhills, near Kirklington, 1944, E. C. WALLACE.

*615/15. POLYGONUM AEQUALE Lindm. *103, M. Ebudes; J. W. H. Harrison *et al.* (1941C: 295). *104, N. Ebudes; Sanday, J. W. H. Harrison (1939E: 113).

†615/31. POLYGONUM POLYSTACHYUM Wallich. 6, N. Som.; established among brambles and bushes by the Channel near Ladye Bay, Clevedon, 1943, C. and N. Sandwith (Sandwith, 1944: 473). 50, Denb.; Berwyn and Maerdy, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

†615/32. POLYGONUM CUSPIDATUM Sieb. & Zucc. 47, Mont.; canal bank near Llanllwchaiarn, and Newtown, J. A. Webb (Wade and Webb, 1943: 65). 50, Denb.; Llangollen, 1943, J. A. WEBB, comm. NAT. MUS. WALES.

†616/1. FAGOPYRUM SAGITTATUM Gilib. 44, Carm.; Sandy, 1944, J. A. WEBB, comm. NAT. MUS. WALES (as *F. esculentum* Mch.).

*617/1. OXYRIA DIGYNA (L.) Hill. *73, Kirkc.; cliffs near the summit of the Merrick, 1935, J. E. RAVEN—drawn, but a voucher specimen would be welcome.—ED.

618/2. RUMEX DOMESTICUS Hartm. 64, M.W. Yorks.; roadside, Keld Houses, Greenhow Hill, 1944, E. C. WALLACE: Gearstones, Ribblehead, 1944, W. A. Sledge (*Nat.*, 1945: 24). 65, N.W. Yorks.; about Dent Station and between Garsdale Station and the Moor Cock Inn, W. A. Sledge (*Nat.*, 1944: 144).

618/2×6. Rumex domesticus Hartm.×R. obtusifolius L. 65, N.W. Yorks.; in the localities given above for *R. domesticus*, W. A. Sledge (*Nat.*, 1944: 144).

618/3×6. Rumex crispus L. × R. obtusifolius L. 22, Berks.; near King's Mere on Nine Mile Ride, Wokingham, 1944, D. McClintock, det. J. E. Lousley. 64, M.W. Yorks.; by pond at Copgrove, 1944, E. C. Wallace: rubbish tip near Leeds, W. A. Sledge (*Nat.*, 1945: 24).

618/6×20. Rumex obtusifolius L. × R. Patientia L. 39, Staffs.; by River Trent, with parents, 1944, R. C. L. Burges, conf. J. E. Lousley.

618/9×3. Rumex conglomeratus Murr. × R. crispus L. 64, M.W. Yorks.; by pond at Copgrove, 1944, E. C. Wallace.

618/9×13. Rumex conglomeratus Murr. × R. maritimus L. 28, W. Norfolk; by pond, South Wootton, 1944, R. P. Libbey; 63, S.W. Yorks.; by lake, Sandbeck Park near Maltby, 1944, J. Brown: both det. J. E. Lousley.

618/11. Rumex pulcher L. 24, Bucks.; by the Mill at Mill End, 1944, D. McClintock. H.12, Wexford; roadsides and waste ground near sea at Arthurstown and Ballyhack, 1940-44, Miss E. Rawlins.

618/12. Rumex palustris Sm. 21, Middx.; site of bombed buildings, Church Street, Chelsea, 1943, J. E. Lousley and W. J. Sladen.

*618/13. Rumex maritimus L. *7, N. Wilts.; Coate Water, 1944, J. D. Grose, det. J .E. Lousley. 65, N.W. Yorks.; reappeared on dried up pond, Berryhills, Kirklington, 1944; considered lost in this station but the pond had not dried up for 50 years before 1943—see Baker (*North Yorkshire*, 364: 1906), E. C. Wallace—and see W. A. Sledge (*Nat.*, 1945: 24).

†618/17. Rumex scutatus L. 34, W. Glos.; on an old wall, Clifton, 1942, Mrs Bell (Sandwith, 1943: 365). 64, S.W. Yorks.; naturalised on a wall at Newsholme, 1943, known for several years, J. A. Whellan.

†621/1. Asarum europaeum L. 12, N. Hants.; in woodland verging into garden (perhaps planted?), Chawton House near Alton, 1943, N. E. G. Cruttwell.

[*]†623/1. Daphne Laureola L. [*]47, Mont.; rare in shrubberies just outside Llanidloes, perhaps introduced, J. A. Webb (Wade and Webb, 1943: 65).

623/2. Daphne Mezereum L. 12, N. Hants.; 11 plants in Birch-Ash-Hawthorn coppice on clay in the middle of an extensive wood near Greywell, 1943, N. E. G. Cruttwell. 62, N.E. Yorks.; Haugh Rigg near Pickering, several plants in a quarry, probably not indigenous but known to the people at a neighbouring farm for 25 years, E. G. Highfield (*Nat.*, 1945: 24).

*626/1. VISCUM ALBUM L. *47, Mont.; orchard at Llandinam, on apple, J. A. Webb (Wade and Webb, 1943: 65).

628/5. EUPHORBIA PLATYPHYLLOS L. 12, N. Hants.; field, Selborne, 1944, Hon. W. J. L. PALMER.

628/6. EUPHORBIA STRICTA L. 34, W. Glos.; on rubble, Kidnalls Wood, between Upper Forge and New Mills, a good many plants, 1944, S. G. CHARLES, comm. W. R. PRICE, who adds "This plant appears to grow in the triangular area between Severn and Wye, but its habit here of springing up spontaneously, generally in cut woods, and then disappearing, makes it appear to be extremely rare. Its few localities on the Monmouthshire side of the Wye seem, however, to be permanent. It was last recorded in Lydney Old Park by myself in 1908, and seemed to be extinct, until Mr Charles made a special search for it."

[*]†628/11. EUPHORBIA CYPARISSIAS L. 8, S. Wilts.; Larkhill, 1943, many fine clumps on the artillery ranges, D. McCLINTOCK. 15, E. Kent.; near Barham Downs in plenty, 1939, in plenty here, with *Salvia pratensis*, appearing native on this wild, remote area of chalk-scrub (a view supported by older records nearer Dover), B. J. BROOKE and F. ROSE. 41, Glam.; limestone Ridge behind Porthcawl, 1941, E. M. THOMAS, det. E. VACHELL. [*]47, Mont.; among shale on the railway bank near Tylwch, J. A. Webb (Wade and Webb, 1943: 65).

*†628/16. EUPHORBIA LATHYRUS L. *47, Mont.; weed among potatoes, Pont Robert, J. A. Webb (Wade and Webb, 1943: 65). H.11, Kilkny.; roadside casual, Rosbercon near New Ross, 1942, Miss E. RAWLINS.

†630/1. RICINUS COMMUNIS L. 35, Mon.; Newport Docks, 1942, JOHN MACQUEEN, comm. NAT. MUS. WALES.

[*]†631/1. BUXUS SEMPERVIRENS L. [*]47, Mont.; naturalised in woods far from houses, Garthmyl, bank of Vyrnwy near Dolganog, near Llwyngwern, Llanllwchaiarn, near Ceinws and Cemmaes, J. A. Webb (Wade and Webb, 1943: 65).

*632/1. MERCURIALIS PERENNIS L. *H.11, Kilkny.; several good colonies in woods of Woodstock demesne, Inistiogue on R. Nore. 1940-1944, Miss E. RAWLINS.

*632/2. MERCURIALIS ANNUA L. *H.13, Co. Carlow; allotment. Borris, 1939-1944, persistent, Miss E. RAWLINS.

633/1×2. ULMUS GLABRA Huds. × CARPINIFOLIA Gled. 39, Staffs.; Cannock and also near Whitgreave, 1944, E. S. EDEES, det. R. MELVILLE.

633/1×4. ULMUS GLABRA Huds. × PLOTII Druce. 39, Staffs.; roadside between Great Bridgeford and Whitgreave, 1944, E. S. EDEES, det. R. MELVILLE.

*633/2. ULMUS CARPINIFOLIA Borkh. *47, Mont.; Newtown, near Cemmaes and near Nantoer, J. A. Webb (Wade and Webb, 1943: 65, as *U. nitens* Moench).

633/3. ×ULMUS HOLLANDICA Mill. 47, Mont.; Nantoer, Morbren, Abermule, near Moat Lane and near Cemmaes, J. A. Webb (Wade and Webb, 1943: 65).

633/3a. ×ULMUS HOLLANDICA Mill. var. **major** (Sm.) Rehd. 39, Staffs.; Butteron near Whitmore, 1944, E. S. EDEES, det. R. MELVILLE.

633/4(2). ULMUS DIVERSIFOLIA Melville. 25, E. Suff.; Burgh Castle, 1938, A. E. ELLIS, det. R. MELVILLE.

*634/1. HUMULUS LUPULUS L. *H.13, Carlow; Borris, 1940-44, Miss E. RAWLINS.

†636/1. FICUS CARICA L. 44, Carm.; stony dykes, Pwll Marsh, near Pembrey, 1944, J. A. WEBB, comm. NAT. MUS. WALES.

*641/1. MYRICA GALE L. *H.13, Carlow; bog on Carlow side of Old Deer Park bog, Newtownbarry, 1942, Miss E. BOOTH, comm. Miss E. RAWLINS.

642/3. BETULA NANA L. 98, Argyll M.; very fine on Rannoch Moor beside Loch Ba, 1943, R. MACKECHNIE and E. C. WALLACE.

642/3×2. BETULA NANA L. × PUBESCENS Ehrh. 98, Argyll M.; one bush on moor beside Loch Ba, Rannoch Moor, 1943, R. MACKECHNIE and E. C. WALLACE.

†643/2. ALNUS INCANA Medik. 47, Mont.; rocky slopes, Glaspwll Valley, J. A. Webb (Wade and Webb, 1943: 65).

644/1. CARPINUS BETULUS L. 34, W. Glos.; coppiced shrub apparently wild, woods opposite Tintern Abbey, 1942, W. R. PRICE.

*646/1. QUERCUS ROBUR L. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 296).

*646/2. QUERCUS PETRAEA Lieblein. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 296, as *Q. sessiliflora* Salisb.).

†646/3. QUERCUS CERRIS L. 47, Mont.; not infrequent as a planted tree, apparently naturalised near Nantoer, Uwchygarreg, Gelligoch, etc., J. A. Webb (Wade and Webb, 1943, 65).

†647/1. CASTANEA SATIVA Mill. 47, Mont.; rather frequent as a planted tree, Berriew, Dolforgan, Dolforwyn and Penstrowed, J. A. Webb (Wade and Webb, 1943: 66).

†648/1. JUGLANS REGIA L. 47, Mont.; a large tree near the canal bank at Llanllwchaiarn, Pool Quay, and seedling trees on the lineside at Montgomery station, J. A. Webb (Wade and Webb, 1943: 66).

650/2×1. SALIX FRAGILIS L. × PENTANDRA L. 47, Mont.; Rhiew Valley, Llanllugan to Manafon and Pantyffridd, J. A. Webb. Recorded as *S. pentandra* (Wade and Webb, 1943: 66), H. H. Haines of Glyncogan Hall, after the publication of the above, suggested to me that the Rhiew Valley willow is ×*S. Meyeriana* (=*S. fragilis* × *pentandra*), a determination with which I agree. The records for the Banwy Valley and Guilsfield are probably referable to the hybrid, A. E. WADE.

*650/3. SALIX ALBA L. *47, Mont.; Abertanat, near Llanfair Caereinion and near Pentre Leylin, J. A. Webb (Wade and Webb, 1943: 66).

*650/4. SALIX TRIANDRA L. *47, Mont.; Welshpool, Buttington, near Pool Quay and near Leighton, J. A. Webb (Wade and Webb, 1943: 66).

*650/5. SALIX PURPUREA L. *44, Carm.; Wenallt, near Five Roads, 1944, J. A. WEBB, comm. NAT. MUS. WALES. *47, Mont.; below Vastre, near Pool Quay and Meifod, J. A. Webb (Wade and Webb, 1943: 66).

650/7. ×SALIX SMITHIANA Willd. 47, Mont.; frequent around Machynlleth and in the Dovey Valley, and Derwenlas, J. A. Webb (Wade and Webb, 1943: 66).

650/13. SALIX PHYLICIFOLIA L. 104, N. Ebudes; new to Rhum, Harrison *et al.* (1944: 115).

*650/17. SALIX MYRSINITES L. *104, N. Ebudes; towards the summit of the Black Hill, Rhum, W. A. Clark (1944: *Vasc.*, *29*, 6).

651/2b. POPULUS TREMULA L. var. VILLOSA (Lang) Syme. 41; Glam.; Kenfig Hill, 1944, E. M. THOMAS, det. at NAT. MUS. WALES.

*†651/3. POPULUS NIGRA L. *47, Mont.; Newtown and Fronfraith, J. A. Webb (Wade and Webb, 1943: 66).

*652/2. EMPETRUM HERMAPHRODITICUM (Lange) Hagerup. *104, N. Ebudes; Rhum, Harrison *et al.* (1944: 115).

654/1. HYDROCHARIS MORSUS-RANAE L. 63, S.W. Yorks.; Thorne Gyme, 1943, J. M. Taylor (*Nat.*, 1943: 117; 1944: 19). 65, N.E. Yorks.; Ainderby Bottoms, 1943, C. M. Rob (*Nat.*, 1944: 19).

*659/1. HAMMARBYA PALUDOSA (L.) O. Kze. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 297, as *Malaxis p.*).

*664/2. SPIRANTHES SPIRALIS (L.) C. Koch. *H.13, Carlow; Kilree near Bagnelstown, 1942, Miss E. RAWLINS.

*664/3b. SPIRANTHES ROMANZOFFIANA Cham. var. STRICTA (Rydb.) Druce. *103, M. Ebudes; coll, J. H. Harrison, 1939; J. W. H. Harrison (1941C: 297, as *S. stricta*)—confirms the suggestion in *C.F.* that "perhaps this was the *S. spiralis* found in the Isle of Coll; see *B.E.C.*, 212, 1924."

667/2. CEPHALANTHERA DAMASONIUM (Mill.) Druce. 34, W. Glos.; very rare here, Knockalls Inclosure, Redbrook, 1942, S. G. CHARLES, comm. W. R. PRICE (as *C. grandiflora* (L.) S. F. Gray).

668/1. EPIPACTIS PALUSTRIS (L.) Crantz. 49, Carn.; bog at Pen Hyddgan, Nevin, plentifully, 1940, J. A. WHELLAN.

668/3(3). EPIPACTIS VECTENSIS (T. & T. A. Steph.) Brooke & Rose. 59, S. Lancs.; Freshfield, detected by W. G. TRAVIS and C. THOMAS in 1942, determined 1943.

668/3(4). EPIPACTIS PENDULA C. Thomas. 30, Beds.; Streatley: Barton: both 1944; shown me at Streatley in 1926 by Sir F. Mander, as *E. media*, det. Tahourdin, and seen by Mr Thomas in 1943, and again in 1944 at Streatley and Barton, where it had been found by A. J. WILMOTT and myself a few weeks previously, J. G. DONY, det. C. THOMAS.

668/4. EPIPACTIS PURPURATA Sm. 30, Beds.; Deadmansea Wood, Whipsnade, 1941, J. G. DONY.

669/4. ORCHIS USTULATA L. 12, N. Hants.; Ladle Hill, 1944, H. WHEELER, comm. A. J. WILMOTT. 64, M.W. Yorks.; sparingly about The Bottoms, Burton Leonard, 1943, E. C. WALLACE.

669/6. ORCHIS PARDALINA Pugsl. 3, S. Devon; Tod Moor, Ermington, in small quantity, with numerous *O. praetermissa* and fairly numerous hybrids, 1943, E. M. PHILLIPS, det. H. W. PUGSLEY.

*669/8. ORCHIS PRAETERMISSA Druce. 2, E. Cornw.; near Pool, Sheviock, 1943, E. M. PHILLIPS. 3, S. Devon; Forder Valley, Egg Buckland: Tod Moor, Ermington, the predominant marsh orchid there: both 1943, E. M. PHILLIPS. *47, Mont.; Talerddig, Pennant Valley, Llanbrynmair, Glaspwll, and near Carno, J. A. Webb (Wade and Webb, 1943: 66).

*669/9. ORCHIS PURPURELLA T. & T. A. Steph. 74, Wigton; Mull of Galloway, 1934, G. TAYLOR, det. and comm. A. J. WILMOTT. *84, Linl.; Dalmeny, 1934, G. TAYLOR, det. and comm. A. J. WILMOTT. *103, M. Ebudes; Coll, Tiree, and Gunna, J. W. H. Harrison *et al.* (1941C: 298).

669/9(2). ORCHIS OCCIDENTALIS (Pugsl.) Wilmott. 103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 298, as *O. majalis* subsp. *occ.*). 104, N. Ebudes; Kilmory-Kinloch area in Rhum, J. W. H. Harrison (1944: *Vasc.*, *29*, 6, as *O. majalis* Reichb.).

*669/10. ORCHIS ERICETORUM (Linton) E. S. Marshall. *16, E. Kent; abundant on the bogs, Hothfield Heath, 1944, hybridising with *O. praetermissa*, F. ROSE. *47, Mont.; rather frequent, near Carno, etc., J. A. Webb (Wade and Webb, 1943: 66): bog on Boncyn Celyn, S.E. of Lake Vyrnwy, 1942, J. W. GOUGH and N. Y. SANDWITH: bog near Llangurig, 1943, J. BEDFORD, conf. and comm. A. J. WILMOTT.

669/10×8. ORCHIS ERICETORUM (Linton) E. S. Marshall × PRAETERMISSA Druce. 14, E. Suss.; Ashdown Forest, 1943, J. R. WALLIS (as *O. maculata* × *praetermissa*).

669/10×11(2). **Orchis ericetorum** (Linton) E.S.M. × **O. hebridensis** Wilmott. 110, O. Hebr.; Vatersay and Barra, J. W. H. Harrison (1941B: 259, as *O. ericetorum* × *O. Fuchsii* var. *hebridensis*).

*669/11. ORCHIS FUCHSII *Druce*. *47, Mont.; near Forden and near Carno, J. A. Webb (Wade and Webb, 1943: 66): edge of a pond near Welshpool, 1943, J. BEDFORD, det. and comm. A. J. WILMOTT. *110, O. Hebr.; " typical specimens . . . from Barra, Vatersay, and S. Uist," J. W. H. Harrison (1941B: 259).

669/11(2). ORCHIS HEBRIDENSIS Wilmott. 103, M. Ebudes; Coll, Tiree, and Gunna, J. W. H. Harrison *et al.* (1941C: 298, as *O. maculata* var. *h.*). 104, N. Ebudes; Rhum, Harrison *et al.* (1944: 115, as *O. maculata* var. *h.*).

669/11(2)×7. **Orchis hebridensis** Wilmott × **O. latifolia** L. sec. Pugsl. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 298, as *O. maculata* var. *hebridensis* × *O. latifolia* L.).

669/11(2)×9. **Orchis hebridensis** Wilmott × **O. purpurella** T. & T. A. Steph. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 298, as *O. maculata* var. *hebridensis* × *purpurella*).

669/11(2)×10. **Orchis hebridensis** Wilmott × **O. ericetorum** (Linton) E. S. Marshall. 103, M. Ebudes; Coll, J. W. H. Harrison (1941C: 298, as *O. maculata* var. *hebridensis* × *O. ericetorum*).

*669(2)/1. ANACAMPTIS PYRAMIDALIS (L.) Rich. 40, Salop; a form with spurless flowers and with the labellum replaced by a sepal resembling the lateral sepals was found near Oswestry by Miss A. G. Cook; the flowers were quite regular and bore a superficial resemblance to those of *Erythraea* spp., comm. Nat. Mus. Wales. *47, Mont.; sparingly on limestone screes at Careghofa, J. A. Webb (Wade and Webb, 1943: 66).

669(3)/1. Himantoglossum hircinum (L.) C. Koch. 7, N. Wilts.; " near Marlborough," 1942 (*Rep. Marlb. Coll. N.H.S., No. 91* (1943), 12).

673/1. Herminium Monorchis (L.) R. Br. 33, E. Glos.; Cranham, 1943, M. J. Mulligan, comm. A. J. Wilmott.

*674(1)/1. Gymnadenia conopsea (L.) R. Br. *71, Man; Ballaugh Curraghs, 1943, Mrs Megaw, comm. A. J. Wilmott (from C. I. Paton).

674(1)/1×669/11(2). **Gymnadenia conopsea** (L.) R. Br. × **Orchis hebridensis** Wilmott. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 298, as *O. maculata* var. *hebridensis* × *Gymnadenia conopsea*).

674(2)/1. Leucorchis albida (L.) E. Mey. ex Schur. 98, Argyll M.; hillocks on moor by Loch Tulla near Forest Lodge, 1943, E. C. Wallace. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 298).

674(3)/1. Coeloglossum viride (L.) Hartm. 33, E. Glos.; Cranham, 1943, M. J. Mulligan, comm. A. J. Wilmott.

674(3)/1×674(1)/1. **Coeloglossum viride** (L.) Hartm. × **Gymnadenia conopsea** (L.) R. Br. 103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 298).

*674(5)/1. Platanthera chlorantha (Cust.) Rchb. *71, Man; Sully Curraghs, 1943, C. I. Paton, comm. A. J. Wilmott—add to *C.F.* but see Paton (1933: *N.W. Nat.*, 594) for previous record.

*674(5)/2. Platanthera bifolia (L.) Rchb. *71, Man; Ballaugh Curraghs, 1943, Mrs Megaw, comm. (C. I. Paton to) A. J. Wilmott—add to *C.F.* but see Paton (1933: *N.W. Nat.*, 594) for previous record.

*680/1. Sisyrinchium angustifolium Mill. 14, E. Suss.; Fishergate, near Portslade, 1941,—, comm, A. H. Wolley-Dod. *96, Easterness; roadside ditch near Castle Urquhart towards Fort Augustus, 1944, M. S. Campbell. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 299).

†683/1. Tritonia crocosmiflora Nich. 44, Carm.; Hendy, and coal tips, Ammanford, 1944, J. A. Webb, comm. Nat. Mus. Wales. 47, Mont.; Garthmyl and Tylwch, J. A. Webb (Wade and Webb, 1943: 66).

†684/2. Narcissus hispanicus Gouan. 47, Mont.; frequent in orchards and about ruins chiefly *flore pleno*, Mochdre, Fron, Gregynog, Kerry, Pennant, and Berriew, J. A. Webb (Wade and Webb, 1943: 66, as *N. major* Curt.).

†684/4. NARCISSUS POETICUS L. 47, Mont.; Fron, Pennant, Cefn-bryn-talch, Powis Park, Gregynog, alder copses a mile below Bwlch-y-ffridd, Leighton, Abermule and Bettws, J. A. Webb (Wade and Webb, 1943: 67).

*685/1. GALANTHUS NIVALIS L. 36, Heref.; an escape, Purlieu Lane, Colwall, 1943, F. M. DAY. *47, Mont.; abundant in and around Kerry churchyard, streamside Kerry, by the Rhiew between Berriew and East Garthnyl, and near Mochdre, J. A. Webb (Wade and Webb, 1943: 67).

*†689/1. RUSCUS ACULEATUS L. *47,, Mont.; near cottages at Pandy, in hedges some distance from houses near Llanllugan, near Mochdre and Machynlleth, J. A. Webb (Wade and Webb, 1943: 67).

†690/2. ASPARAGUS OFFICINALIS L. 47, Mont.; Llanerch, J. A. Webb (Wade and Webb, 1943: 67)—first record for v.-c. 47.

691/3. POLYGONATUM OFFICINALE All. 3, S. Devon; Elfordleigh, Plympton St Mary, 1943, E. M. PHILLIPS.

†698/2. ASPHODELUS TENUIFOLIUS Cav. 16, W. Kent; Beckenham Park Place, 1934, E. J. BUNNETT, det. J. E. LOUSLEY.

*†702/7. ALLIUM TRIQUETRUM L. *5. S. Som.; Porlock Weir, 1944, J. D. GROSE.

†702/19. ALLIUM PARADOXUM (M.B.) G. Don. 26, W. Suff.; in a small copse at Bury St Edmunds, abundantly, 1944; the copse was subsequently ploughed so the plant may disappear, J. A. WHELLAN. 33, E. Glos.; roadside, a good many plants, near junction of Stroud and Tetbury roads, Cirencester, 1941, Miss K. H. MACAULAY, comm. J. P. M. BRENAN, first record for the county.

†704/1. MUSCARI COMOSUM (L.) Mill. 33, E. Glos.; several bulbs in a field, Sweetslade Farm. Bourton-on-the-Water, 1943, W. S. BELCH, comm. W. R. PRICE.

707/2. ORNITHOGALUM UMBELLATUM L. 8, S. Wilts.; Larkhill, 1943, out on the ranges, D. MCCLINTOCK. 54, N. Lincs.; Chapel Point, 1943, probably escaped, D. MCCLINTOCK.

†707/3. ORNITHOGALUM NUTANS L. 12, N. Hants.; a large patch in a small copse near Mapledurwell, 1943 [shown by Miss THORP of Mapledurwell to] N. E. G. CRUTTWELL. 14, E. Sussex; Forge Wood near Worth—to correct the entry in *B.E.C. 1927 Rep.*, 421, 1928, where the county is given in error as Kent, E. C. WALLACE and J. E. LOUSLEY.

716/1. PARIS QUADRIFOLIA L. 66, Durham; still in Flatts Woods, Barnard Castle, confirmation of old record, J. B. Nicholson (1942: *Vasc.*, *27*, 16).

*718/1. Juncus maritimus Lam. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 299). *110, O. Hebr.; S. Uist and N. Uist, J. W. H. Harrison (1941B: 261).

718/4b. Juncus effusus L. var. compactus Lej. & Court. 47, Mont.; near Newtown and Dolfor, J. A. Webb (Wade and Webb, 1943: 67).

*718/5. Juncus inflexus L. *47, Mont.; very local, below Montgomery Castle, near Penegoes and Talywern, J. A. Webb (Wade and Webb, 1943: 67).

*718/6. Juncus balticus Willd. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 299).

718/8. Juncus subnodulosus Schrank. 16, W. Kent; one plant, Snodland Marshes, 1943: below Crayford, 1944: abundant in Holborough Marshes, 1944—the only recent W. Kent records—now almost certainly gone from " Marshes above Woolwich " (found by J. S. Mill about 1863, recorded in *Fl. Kent*, 1899), F. Rose. 64, M.W. Yorks.; Upper Dunsforth: Cow Mires, Galphay: Crosper and Aketon near Spofforth: Farnham Mires: Foster Flat, Copgrove: near Grewelthorpe: all 1943, E. C. Wallace (see *Nat.*, 1944: 19). Also plentiful in dykes bordering the railway between Towton and Church Fenton, W. A. Sledge (*l.c.*).

*718/14. Juncus compressus L. 16, W. Kent; abundant on Halling Marshes: Cuxton: Upnor: Shorne Marshes: all 1944, apparently replacing *J. Gerardi* by the tidal Medway, where I have not seen the latter for certain, F. Rose. *63, S.W. Yorks.; abundant by the shores of Ulley Reservoir and sparingly in the quarry at Woodend, Shireoaks, 1943, John Brown (1944: *N.W. Nat.*, *18*, 326): Black Drain, Bankside, Thorne, 1943, J. M. Taylor (*Nat.*, 1944: 19): canal reservoir, East Cowick, J. M. Taylor (*Nat.*, 1945: 24). 64, M.W. Yorks.; two places near Occaney, Knaresborough, 1943, E. C. Wallace (see *Nat.*, 1944: 19).

*†718/16. Juncus macer S. F. Gray. 22, Berks.; a single clump in the open turf of Easthampstead Park, 1944, D. McClintock. *44, Carm.; Lower Twrch Gorge, 1944, J. A. Webb, comm. Nat. Mus. Wales. *47, Mont.; roadside, Dolanog, 1944, C. E. Raven. 63, S.W. Yorks.; Doncaster, S. P. Rowlands (*Nat.*, 1945: 24). *101, Cant.; sandy path, Knapdale, near Tarbert, 1944, J. S. L. Gilmour, add to *C.F.* but see Lees *Fl. Clyde* for previous record.

*718/19. Juncus capitatus Weigel. *110, O. Hebr.; Barra, J. W. H. Harrison (1941B: 261).

718/22. Juncus biglumis L. 98, Argyll M.; Beinn Acholadair, Ben Douran sparingly, 1943, R. Mackechnie and E. C. Wallace.

*719/2. LUZULA PILOSA (L.) Willd. *H.12, Wexford; Stokestown Woods, 1943-44, Miss E. RAWLINS: also at Newtownbarry, 1943, Miss E. BOOTH, comm. Miss E. RAWLINS.

†719/9. LUZULA LUZULOIDES (Lam.) Dandy & Wilmott. 59, S. Lancs.; on a shady bank in Marsden Park, Nelson, a few tufts shown to me by A. Turner who says it has been known at least 20 years, before the ground was enclosed as a park, 1943-4, J. A. WHELLAN (as *L. nemorosa* (Poll.)).

*722/1. SPARGANIUM NEGLECTUM Beeby. 33, E. Glos.; ditches round Fiddington and Tewkesbury (much commoner than *S. ramosum*), 1944, C. W. BANNISTER, comm. W. R. PRICE (Mr F. M. Day reports (1943) *S. ramosum* the only form in R. Leadon at Highleadon, v.-c. 34). *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 300).

722/2. SPARGANIUM RAMOSUM Huds. 33, E. Glos.; pool near Mythe Tute, Tewkesbury: 34, W. Glos.; R. Leadon, Hartpury: both 1943, F. M. DAY.

*722/3. SPARGANIUM SIMPLEX Huds. *47, Mont.; canal near Four Crosses and Arddleen, J. A. Webb (Wade and Webb, 1943: 67). 64, M.W Yorks.; swampy pond by stream, Staveley, 1943, E. C. WALLACE.

723/1(2). ARUM NEGLECTUM (Towns.) Ridley. 13, W. Suss.; next season's leaves well advanced and conspicuous, September 29th, 1944, on chalky bank by road near Swanbourne Lake, Arundel Park, E. C. WALLACE.

727/2. LEMNA POLYRHIZA L. 21, Middx.; in a static-water tank by the Thames, Millbank, London, S.W.1, 1943, with *L. minor*, D. McCLINTOCK.

727/3. LEMNA TRISULCA L. 64, N.W. Yorks.; in flower in pool at Fountains Abbey, 1944, E. C. WALLACE.

729/2. ALISMA LANCEOLATUM With. 7, N. Wilts.; Coate Water, [L. G. PEIRSON], 1943 (*Rep. Marlb. Coll. N.H.M., No. 92* (1944), 11: also Thornend (J. D. Grose, 1944: 350).

731/1. LURONIUM NATANS (L.) Raf. 39, Staffs.; canal, Whittington, 1943, R. C. L. BURGES (as *Elisma natans*).

732/1. SAGITTARIA SAGITTIFOLIA L. 34, W. Glos.; brook, Knockalls Inclosure, Redbrook, 1942, S. G. CHARLES, comm. W. R. PRICE.

733/1. DAMASONIUM ALISMA Mill. 20, Herts.; a large number of specimens are reported from a new locality in south Hertfordshire (F. W. Jane, 1944: *Trans. Herts. N.H. Soc.*, *22*, 55).

*734/1. Butomus umbellatus L. *47, Mont.; canal near Pentre Leylin, J. A. Webb (Wade and Webb, 1943: 67).

*737/1×9. ×Potamogeton sparganifolius Laestad. ex Fr. *67, Northumb. S.; R. Tyne at Riding Mill, J. W. H. Harrison (1942: *Vasc.*, *27*, 31).

*737/4. Potamogeton coloratus Hornem. 63, S.W. Yorks.; Balne pond, and ditch near Sourpiece Wood, Owston near Askem, J. M. Taylor (*Nat.*, 1945: 24). 64, M.W. Yorks.; ditch in lane near Farnham Mires, 1944, G. Taylor (*Nat.*, 1945: 24). *104, N. Ebudes; Rhum, Harrison *et al.* (1944: 115). *110, O. Hebr.; Benbecula and Monach Is., J. W. H. Harrison (1941B: 262)—recorded in the *Entomologist* (1941: 4) and by Dandy and Taylor (1941: *J.B.*, 99).

*737/5. Potamogeton alpinus Balb. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 117)—not seen by Dandy and Taylor. *110, O. Hebr.; Benbecula, J. W. H. Harrison (1941B: 262); Dandy and Taylor (1941: *J.B.*, 99).

*737/9×13. ×Potamogeton Zizii Koch ex Roth. *67, Northumb. S.; Crag Lough, J. W. H. Harrison (1942: *Vasc.*, *27*, 23).

737/13. Potamogeton lucens L. 110, O. Hebr.; swift runnel near Loch Kildonan, S. Uist, J. W. H. Harrison (1943: *Vasc.*, *28*, 24).

*737/15. Potamogeton praelongus Wulf. 30, Beds.; plentiful in R. Ouse between Bedford and Cardington; 1944, J. E. Dandy: floating in same river at Eaton Socon, 1944, J. G. Dony: det. J. E. Dandy and G. Taylor. *47, Mont.; canal, Pool Quay, J. A. Webb (Wade and Webb, 1943: 67)—confirmed by Dandy and Taylor. 63, S.W. Yorks.; Boating Dike, Jacques Bank, east of Thorne, with *P. lucens*, J. M. Taylor (*Nat.*, 1945: 24). *66, Durham; R. Wear, J. W. H. Harrison (1943: *Vasc.*, *28*, 24).

737/15×16. ×Potamogeton cognatus Aschers. & Graebn. 67, Northumb. S.; Crag Lough, J. W. H. Harrison and W. A. Clark (1942: *Vasc.*, *27*, 29)—new to Britain.

*737/16. Potamogeton perfoliatus L. *47, Mont.; canal between Pool Quay and Welshpool, and Pentre Leylin, J. A. Webb (Wade and Webb, 1943: 67)—canal plant confirmed, other not seen, by Dandy and Taylor.

737/16×17. ×Potamogeton Cooperi (Fryer) Fryer. 66, Durham; R. Wear near Chester-le-Street, J. W. H. Harrison (1944: *Vasc.*, *29*, 31) —new to the vice-county. 110, O. Hebr.; S. Uist, 1942, W. A. Clark (*Vasc.*, *27*, 20; also *P.U. Durham P.S.*, *10*, 365, det. J. W. H. Harrison) —new to the vice-county.

*737/17. Potamogeton crispus L. *47, Mont.; Lymore, Montgomery, 1912, H. J. Riddelsdell in Herb. Butt; det. J. E. Dandy and G. Taylor: canal at Berriew, J. A. Webb (Wade and Webb, 1943: 67)—added to annotated *C.F.*, not in *Welsh Fl. Pl.*—Ed.

*737/19. Potamogeton acutifolius Link. *67, Northumb. S.; very sparingly in a backwater between Riding Mill and Carbridge, J. W. H. Harrison (1942: *Vasc.*, *27*, 23).

*737/20. Potamogeton obtusifolius M. & K. *110, O. Hebr.; Loch Snigisclett, S. Uist, J. W. H. Harrison (1943: *Vasc.*, *28*, 24).

*737/22. Potamogeton Friesii Rupr. 30, Beds.; R. Ouse, Bedford, 1944, J. E. Dandy. *66, Durham; in an old clay pit just west of the railway near Birtley, J. W. H. Harrison (1944: *Vasc.*, *29*, 24). *67, Northumb. S.; Bolam Lake, J. W. H. Harrison (1943: *Vasc.*, *28*, 24).

737/23. Potamogeton Berchtoldii Fieb. 30, Beds.; Battlesden, 1943, J. E. Dandy: Stockgrove, Heath and Reach, 1944, J. G. Dony; det. J. E. Dandy and G. Taylor.

*737/24. Potamogeton rutilus Wolfg. *110, Hebrides; N. Uist, J. W. H. Harrison (1942: *Vasc.*, *27*, 28).

737/25. Potamogeton pusillus L. (*P. panormitanus* Biv.). 30, Beds.; River Ouse, Bedford, 1944, J. E. Dandy: Melchbourne: Eaton Socon: Leighton Buzzard: Heath and Reach: all 1944, J. G. Dony; all det. J. E. Dandy and G. Taylor. *66, Durham; old clay pond south of Birtley, det. J. W. H. Harrison (1942: *Vasc.*, *27*, 8, 21). *67, Northumb. S.; Crag Lough, J. W. H. Harrison (1942: *Vasc.*, *27*, 31)—add to *C.F.*

738/2. Ruppia rostellata Koch. 49, Carn.; abundant at seaward end of Ystumllyn, near Criccieth, 1943, J. A. Whellan.

*739/1. Zannichellia palustris L. *H.13, Carlow; pond by roadside, Kilcotrim near Borris, 1942, Miss E. Rawlins.

740/1(2). Zostera Hornemanniana Tutin. 104, N. Ebudes; in pools on Hyskeir reef, J. W. H. Harrison (1939E: 117).

*740/2. Zostera nana Roth. *103, M. Ebudes; washed ashore on Coll, J. W. H. Harrison *et al.* (1941C: 301).

*741/2. Naias flexilis Rostk. & Schmidt. *110, O. Hebr., S. Uist, J. W. H. Harrison (1941B: 263).

†744/1. Cyperus longus L. 41, Glam.; Maerdy Pool, obviously introduced, R. L. Smith (*Trans. Cardiff N.S.*, *71*, 31).

*745/2. Eleocharis uniglumis (Link) Schultes. *16, W. Kent; Birling: Snodland to New Hythe, in the Marshes: both 1943; Holborough Marshes: E. of Cooling: Higham Marshes: Shorne Marshes: Northfleet Brooks: all 1944—see note on this species in W. Kent, F. Rose.

745/4. Eleocharis acicularis (L.) R. Br. 8, S. Wilts.; near Free Warren, 1943 (*Rep. Marlb. Coll. N.H.M., No. 92* (1944), 11).

*746/1. Scirpus sylvaticus L. 22, Berks.; streamside by Greenham Common, 1944, D. McClintock. *42, Brecon; bank of River Wye below Builth Wells, 1943, J. A. Whellan. *47, Mont.; Llanfair Caereinion and near Guilsfield, J. A. Webb (Wade and Webb, 1943: 68).

746/2. Scirpus maritimus L. 18, S. Essex; plentiful at margin of pond, 310 ft. alt., Danbury, 1944, J. A. Whellan.

746/3. Scirpus lacustris L. 34, W. Glos.; Cannop Ponds, Forest of Dean, 1943, first record for Flora district 4, S. G. Charles, comm. W. R. Price.

746/4. Scirpus Tabernaemontani C. Gmel. 63, S.W. Yorks.; dike on west side of Thorne Moor near the colliery, J. M. Taylor (*Nat.*, 1945: 24).

746/11. Scirpus setaceus L. 15, E. Kent; Chiddenden Wood, 1943, J. R. Wallis. 30, Beds.; Rushmere, Heath and Reach, 1944, E. Milne-Redhead and J. G. Dony.

*746/12. Scirpus cernuus Vahl. *47, Mont.; Dovey Salt Marsh, J. A. Webb (Wade and Webb, 1943: 68, as *S. filiformis* Savi).

747/1. Eriophorum latifolium Hoppe. 64, M.W. Yorks.; Farnham Mires, western Brearton portion, 1943, confirmation of a record in Baines *Fl. Yorks.*, 1840, E. C. Wallace (see *Nat.*, 1944: 20).

749/1. Schoenus nigricans L. 64, M.W. Yorks.; Brearton end of Farnham Mires: Cow Mires, Galphay: Aketon near Spofforth: and at Foster Flat near Copgrove: all 1943, E. C. Wallace (see *Nat.*, 1944: 20).

*750/1. Cladium Mariscus (L.) R. Br. 64, M.W. Yorks.; swampy wood between Copgrove and Newby, 1944, confirming J. Dalton's record (c. 1800)—see Lees (*Fl. W. Yorks*, 453, 1888), E. C. Wallace—and see W. A. Sledge (*Nat.*, 1945: 24-25). *101, Cant.; edge of loch near Dunmore House, W. Loch Tarbert, 1944, J. S. L. Gilmour. *110, O. Hebr.; Benbecula and N. Uist (*P.U. Durh. P.S.*, *10*, 264) [*Vasc.*, *28*, 1].

*753/2. Carex riparia Curt. *47, Mont.; near Dovey Junction, J. A. Webb (Wade and Webb, 1943: 68). *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 303).

*753/3. Carex acutiformis Ehrh. *110, O. Hebr.; Baleshare; *111, Orkney; S. Ronaldshay (Harrison, 1944: *Vasc.*, *29*, 15, both det. E. Nelmes).

753/3b. Carex acutiformis Ehrh. forma spadicea (Roth) Aschers. & Graebn. 28, W. Norf.; elevated river bank, R. Nar at Marham, 1942, E. L. Swann.

*753/4. Carex vesicaria L. *110, O. Hebr.; S. Uist, J. W. H. Harrison (1941B: 266).

*753/7. Carex rostrata Stokes. *47, Mont.; Bettws Cedewain to Panney, J. A. Webb (Wade and Webb, 1943: 68)—added to annotated *C.F.*

753/8. Carex lasiocarpa Ehrh. 28, W. Norf.; swamp at Derby Fen, Grimston, 1942, E. L. Swann. 49, Carn.; plentiful in bog near Pen Hyddgan, Nevin, 1940, J. A. Whellan. 65, N.W. Yorks.; abundant but apparently not flowering in a carr near Morton le Moor, 1944, E. C. Wallace. 98, Argyll M.; Loch Ba, Rannoch Moor and in several nearby lochans, 1943, R. Mackechnie and E. C. Wallace.

*753/9. Carex hirta L. *47, Mont.; Luggy, near Carno and Llandyssil, J. A. Webb (Wade and Webb, 1943: 68).

*753/10. Carex pendula Huds. *H.13, Carlow; woods, Borris demesne, 1940-44, Miss E. Rawlins.

753/12. Carex strigosa Huds. 15, E. Kent; Snarkhurst Wood, Hollingbourne: abundant in a copse east of Lenham: both on gault clay, which this species favours in Kent, both 1944, F. Rose. 16, W. Kent; Ryarsh Wood, on gault clay, 1943, F. Rose.

753/13. Carex helodes Link. 34, W. Glos.; cleared sloping wood between Little Dean and Soudley, 1944, E. Nelmes (as *C. laevigata* Sm.).

*753/14. Carex capillaris L. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 118).

753/19. Carex Hostiana DC. 28, W. Norf.; wet places on Roydon Common, 1944, E. L. Swann. 101, Cant.; bog near Dunmore House, W. Loch Tarbert, 1944, J. S. L. Gilmour, det. E. Nelmes.

753/19×20(2). Carex Hostiana DC. × C. tumidicarpa Anderss. 34, W. Glos.; boggy common between Drybrook and Mitcheldean, 1943, E. Nelmes. 101, Cant.; bog near Dunmore House, W. Loch Tarbert, with parents, 1944, J. S. L. Gilmour, det. E. Nelmes.

753/19×21. Carex Hostiana DC. × lepidocarpa Tausch. 64, M.W. Yorks.; marsh by stream near Sunley Rains, Ripon, 1943, E. C. Wallace.

753/21. Carex lepidocarpa Tausch. 28, W. Norf.; very wet fen on chalk, East Walton Common, 1944, E. L. Swann. 33, E. Glos.; in small stream near spring at head of Sheepscombe Valley, 1944, apparently the only species of the "*flava*" group occurring on the Oolitic Limestone of the Cotswolds, E. Nelmes.

*753/22. Carex serotina Mérat. 15, E. Kent; still at Willesborough Leas, 1944; last recorded there by G. E. Smith (Cowell, 1839: *Floral Guide*, p. 69, as *C. Oederi*), F. Rose. 28, W. Norf.; on bare soil following turf cutting at Sugar Fen, Leziate, 1943, E. L. Swann. *33, E. Glos.; in wet muddy hollows in disused gravel pit about half a mile west of S. Cerney, 1943, the only locality for this species known to me in v.-c. 33, E. Nelmes.

753/23. Carex extensa Good. 101, Cant.; brackish marsh near W. Loch Tarbert, 1944, J. S. L. Gilmour, det. E. Nelmes.

753/25. Carex digitata L. 64, M.W. Yorks.; Mackershaw Woods, Fountains, 1943, where *C. ornithopoda* (Lees, *Fl. West Yorks.*, 1888, 798) was looked for without success, W. A. Sledge and E. C. Wallace (see *Nat.*, 1944: 20).

*753/28. Carex caryophyllea Latour. *47, Mont.; Dolforwyn Castle meadows, Leighton, Careghofa quarries and near Llanfyllin, J. A. Webb (Wade and Webb, 1943: 68): grassy bank at Llanwddyn, head of Lake Vyrnwy, 1942, J. W. Gough and N. Y. Sandwith. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 303). *110, O. Hebr.; Pabbay (Barra) and Vatersay, J. W. H. Harrison (1941B: 265).

*753/29. Carex ericetorum Poll. *64, M.W. Yorks.; in aboriginal turf on downland by quarry near Burton Leonard, 1943, on the magnesian limestone and associated with typical lime loving plants (see *Yorks. Nat.*, 1943: 97), E. C. Wallace.

753/30. Carex montana L. 41, Glam.; ridge behind Porthcawl, 1942, E. M. Thomas, det. E. Vachell.

753/31. Carex tomentosa L. 33, E. Glos.; dry sloping wood-border just E. of Colesborne, 1941: grassy roadside between Cirencester and Barnsley, 1942: roadside on Akeman Street in several places between Cirencester and Coln St Aldwyn, 1942: at several spots on edges of woods and, many thousands of plants, in wide grassy ride in Oakley Park, 1½ m. W. of Cirencester, 1942: roadside about 1 m. S.W. of Duntisbourne Abbotts, 1943: roadside on Baunton Downs, near the Foss Way, between Baunton and Calmsden, 1943: E. Nelmes.

753/32. Carex pilulifera L. 34, W. Glos.; very large plants on a recently cleared area of Michael Wood, about 1½ m. E. of Stone, 1944, E. Nelmes. 71, Man; South Barrule, 1943, C. I. Paton, comm. A. J. Wilmott.

*753/34. CAREX PALLESCENS L. *33, E. Glos.; grassy ride in Withington Woods, 1941, E. NELMES. 34, W. Glos.; cleared sloping wood between Little Dean and Soudley, 1944, E. NELMES. *H.12, Wexford; sparingly in woods, Stokestown—demesne New Ross, 1944, Miss E. RAWLINS. *H.13, Carlow; Lucy's Wood, Newtownbarry, 1944, Miss E. BOOTH, comm. Miss E. RAWLINS.

*753/35. CAREX VAGINATA Tausch. *110, O. Hebr.; S. Uist, J. W. H. Harrison (1941B: 265).

*753/37. CAREX PAUPERCULA Michx. *98, Argyll M.; bogs near Clashgour, Inveroran, Bridge of Orchy, 1943, R. MACKECHNIE and E. C. WALLACE, det. E. NELMES. 110, O. Hebr.; near the South Lee, J. W. H. Harrison (1944: *Vasc.*, *29*, 15, confirmed by E. Nelmes).

753/38. CAREX LIMOSA L 98, Argyll M.; bogs by Loch Ba on Rannoch Moor, 1943, R. MACKECHNIE and E. C. WALLACE.

*753/45. CAREX ELATA All. 64, M.W. Yorks.; swamp at Staveley: by pond near Copgrove: The Carr, Marton near Boroughbridge: all 1943, E. C. WALLACE (see *Nat.*, 1944: 20, with records for v.-cc. 63 and 65). *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 302, as *C. Hudsonii* Ar. Benn.). *110, O. Hebr.; Gt. Bernera, Lewis, J. W. H. Harrison (1941B: 265, as *C. Hudsonii* Ar. Benn.).

753/46. CAREX ACUTA L. 64, M.W. Yorks.; by canal, Littlethorpe near Ripon, 1943, E. C. WALLACE—" Note stamens instead of stigmas protruding from the utricles and thus m. *staminifera* Boott, described in 1867 from " Yorkshire." J. A. Whellan sent a specimen recently from Brecon. I have not heard of its occurrence in any other species," E. NELMES.

*753/47. CAREX AQUATILIS Wahl. *45, Pemb.; in a marshy pool near Cilgerran, probably an old bed of the R. Teifi, 1941, J. A. WHELLAN, det. E. NELMES.

753/49(2). CAREX EBORACENSIS Nelmes. 63, S.W. Yorks.; St Ives, Bingley, 1943, A. Malins Smith (1944: *Nat.*, 143), det. E. Nelmes.

753/51(2). CAREX BICOLOR All. 104, N. Ebudes; Rhum, seen over slightly greater area than in 1942, Harrison *et al.* (1944: 116).

753/52. CAREX ELONGATA L. 16, W. Kent; in a small marsh near R. Eden, at Gilridge, above Penshurst, 1944, F. ROSE and J. H. LAVENDER.

†753/53(2). CAREX CRAWFORDII Fernald. 34, W. Glos.; old brick pit at the Lower Lode, near Tewkesbury, 1925, H. H. KNIGHT, det. E. NELMES. Knight had given Riddelsdell specimens in 1925 (he had sent

others one or more years previously) and they were passed on to Kew, presumably after Riddelsdell's death. They came into my hands in 1943. The label bears the identification " *Carex leporina*, slender f." [H.J.R.]. " I agree, C.E.S." Additional notes from letters from Knight in 1943: " I saw the *Carex* there for several years, but now the brick-pit is so overgrown that I cannot find the plant." " I always thought it could not be typical *C. leporina* (*ovalis*). This was not the first time I had sent Riddelsdell specimens of the *Carex* from the Lower Lode. I cannot find in my records when I first found it." " A few days after carding the *Carex* to H.J.R. on 25th June I started with a Bryological friend for Ireland. . . . We wandered about Fishguard and I saw a *Carex* which I think must have been *C. Crawfordii.* But I did not take a specimen." " Cunard steamers from America used to call at Fishguard on their way to Liverpool." The " habitat " seems similar to that in which Mr Lousley found the species in 1937 (see *1937 Rep.*, 515), but timber from N. America had been laid down in the Kentish pit, and Mr Lousley feels certain his plant was introduced with the timber. E. Nelmes.

*753/57×59. ×Carex axillaris Good. *19, N. Essex; plentiful in dry ditch near Coggeshall, with the parents, 1944, J. A. Whellan, det. E. Nelmes.—Neither 18 nor 19 given in *C.F.* but Gibson (1862: *Fl. Essex,* 348) gives localities for every district of the county; add 18 and 19 to *C.F.*—Ed. 34, W. Glos.; south side of Stroudwater Canal, Brimscombe, 1943, R. B. Abell and E. Nelmes (as *C. remota* L. × *Otrubae* Podp.).

*753/58. Carex canescens L. 15, E. Kent; still a few clumps at Willesborough Leas, 1944—last recorded here by Cowell (1839: *Floral Guide*, p. 69, as *C. curta*) and no other recent Kent record, F. Rose. *103, M. Ebudes; Coll, J. W. H. Harrison *et al.* (1941C: 302, as *C. canescens* Lightf.). *110, O. Hebr.; Pabbay (Barra), J. W. H. Harrison (1941B: 265, as *C. curta* Good.). *H.13, Carlow; Ballintree bog near Bagenalstown, 1941-44, Miss E. Rawlins.

753/59(2). Carex vulpina L. 16, W. Kent; Beltring: Whetsted: Brambridges: Leigh: above Tonbridge: Penshurst: S. of Yalding: Gilridge, near Penshurst: below Tonbridge: all 1944, F. Rose. 33, E. Glos.; in rheens between Coombe Hill and Haw Bridge, 1942: withy beds at Walham, about a mile N.W. of Gloucester, 1942: in ditch about half mile S. of Maisemore, 1943: margin of roadside pond about a mile N.W. of Norton, 1944: E. Nelmes. 34, W. Glos.; one plant in withy bed, Chaceley Stock, 1942, E. Nelmes.

*753/60. Carex spicata Huds. 28, W. Norf.; marshy field near Snettisham Beach, 1944, E. L. Swann. *47, Mont.; near Dovey Junction, J. A. Webb (Wade and Webb, 1943: 68).

*753/61. Carex Pairaei F. Schultz. *15, E. Kent; Harrietsham, by roadside, abundant: Ashford Warren: Willesborough Leas: all 1944, F. Rose. 16, W. Kent; roadside bank, Postern Lane near Tonbridge, 1939, J. P. M. Brenan: E. Malling, by the Village Hall; near New Hythe: both 1944, F. Rose. *19, N. Essex; hedge bank near Berechurch, 1944, J. A. Whellan, det. E. Nelmes. 28, W. Norf.; dry hedgebank at Litcham, 1943, E. L. Swann. 34, W. Glos.; path in Michael Wood, about 1½ m. E. of Stone, 1944, E. Nelmes. *47, Mont.; near Penegoes and Cemmaes Road, Llanwrin, Llyfnant Valley and Montgomery Castle, det. E. Nelmes, J. A. Webb (Wade and Webb, 1943: 68): dry bank above Vyrnwy River near Llanwdden, 1942, J. W. Gough and N. Y. Sandwith. 49, Carn.; hedge bank near Llanystumdwy, 1943, J. A. Whellan, det. E. Nelmes. 63, N.E. Yorks.; Doncaster, S. P. Rowlands, det. E. Nelmes (*Nat.*, 1945: 25). *64, M.W. Yorks.; in two places near Spofforth, 1943, see *Yorks. Nat.*, 1943: 116, E. C. Wallace (*Nat.*, 1944: 20): near Baildon Station, A. M. Smith, det. E. Nelmes (*Nat.*, 1945: 25). *110, O. Hebr.; Vatersay, J. W. H. Harrison (1941B: 265).

753/61(2). Carex polyphylla Kar. & Kir. 64, M.W. Yorks.; hedge bank at Copgrove, 1943, E. C. Wallace, det. A. J. Wilmott (as *C. Leersii* F. Schultz), 1944, conf. E. Nelmes.

753/62. Carex divulsa Stokes. 64, M.W. Yorks.; hedge bank, East Keswick, 1944, E. C. Wallace.

*753/63 Carex paniculata L. *47, Mont.; small bog between Meifod and Llyn du, J. A. Webb (Wade and Webb, 1943: 68): bank of Shropshire Union Canal near Llanmynech, 1942, J. W. Gough and N. Y. Sandwith; confirms *C.F.*, not in *Top. Bot. Supps.*, or *Welsh Fl. Pl.* *104, N. Ebudes; Muck, J. W. H. Harrison (1939E: 117).

753/63×57. Carex paniculata L. × remota L. 16, W. Kent; wood near Tunbridge Wells, a single plant, 1943, H. W. Pugsley, comm. J. R. Wallis. 62, N.E. Yorks.; Egton Bridge, S. P. Rowlands (*Nat.*, 1944: 143).

*753/64. Carex appropinquata Schumacher (*C. paradoxa* Willd.). 28, W. Norf.; fen at Wormegay, 1943, E. L. Swann. *103, M. Ebudes; Gunna, only recorded once previously from Scotland, J. W. H. Harrison *et al.* (1941C: 302).

*753/65. Carex diandra Schrank. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 302).

753/67. Carex arenaria L. 15, E. Kent; very abundant for half mile by a sandy roadside W. of Hollingbourne: roadside N. of Leeds Park: Warren Wood, Leeds: all 1944, F. Rose and J. H. Lavender.

753/68. Carex divisa Huds. 28, W. Norf.; marshes in the valley of the R. Nar, South Lynn, 1942, E. L. Swann.

753/74. CAREX PULICARIS L. 15, E. Kent; Chiddenden Wood, 1943, J. R. WALLIS.

753/75. CAREX DIOICA L. 28, W. Norf.; swamp margins at Derby Fen, 1944, E. L. SWANN. 64, M.W. Yorks.; Aketon Marsh near Spofforth: Foster Flat near Copgrove, both 1943, E. C. WALLACE (see *Nat.*, 1944: 20).

*†754/8. PANICUM CRUS-GALLI L. *36, Heref.; kitchen garden at The Downs School, Colwall, probably introduced in chicken food, 1944, F. M. DAY, det. C. E. HUBBARD (as *Echinochloa Crus-galli* (L.) Beauv.).

*†754/8c. PANICUM CRUS-GALLI L. var. BREVISETUM Doll. *35, Monm.; adventive in cultivated garden, Staunton Road, near Monmouth, 1944, R. LEWIS, det. C. E. HUBBARD (as *Echinochloa C.* var. *mitis* (Pursh) Hitchcock).

754/8d. PANICUM CRUS-GALLI L. var. LONGISETUM Doll. 35, Monm.; adventive in cultivated garden, Staunton Road, near Monmouth, 1944, R. LEWIS, det. C. E. HUBBARD. 36, Heref.; kitchen garden at The Downs School, Colwall, F. M. DAY, det. C. E. HUBBARD (as *Echinochloa C.* var. *aristata* S. F. Gray).

*758/3. SPARTINA TOWNSENDI H. & J. Groves. *16, W. Kent; by R. Medway at Cuxton, 1943, F. ROSE.

*770/3. ALOPECURUS MYOSUROIDES Huds. *104, N. Ebudes; a weed on Canna, J. W. Harrison (1939E: 118).

770/4. ALOPECURUS BULBOSUS Gouan. 16, W. Kent; abundant at Upnor in brackish meadow, 1944, J. H. LAVENDER and F. ROSE.

770/5×1. ALOPECURUS GENICULATUS L. × PRATENSIS L. 6, N. Som.; in the corner of a pasture on Tickenham Moor, 1942, C. and N. Sandwith (Sandwith, 1943: 364).

770/6. ALOPECURUS AEQUALIS Sobol. 16, W. Kent; pond in Ryarsh Wood, 1944, F. ROSE and C. WEST. *64, M.W. Yorks.; by a pond between Burton Leonard and Copgrave, 1943, E. C. Wallace (*Nat.*, 1943: 116; 1944: 20): shore of Gouthwaite reservoir, near Ramsgill; *65, N.W. Yorks.; by pond at Berryhills, Kirklington; both 1944, E. C. WALLACE.

*775/1. MILIUM EFFUSUM L. *47, Mont.; Bwlch-y-cibau Glen, J. A. Webb (Wade and Webb, 1943: 68).

777/1g. PHLEUM PRATENSE L. var. NODOSUM (L.) **Huds.** 44, Carm.; Ashburnham, 1944,. J. A. WEBB, comm. NAT. MUS. WALES. 64, M.W. Yorks.; sandy rocky ground, Crosper near Spofforth, 1943, E. C. Wallace (*Nat.*, 1944: 20, as *P. nodosum* L.).

780/2j. AGROSTIS STOLONIFERA L. var. PALUSTRIS (Huds.) Farw. 33, E. Glos.; cornfield about a mile W. of Daglingworth, 1943, E. NELMES, det. C. E. HUBBARD.

780/2(2). AGROSTIS GIGANTEA Roth. 104, N. Ebudes; Canna, J. W. H. Harrison (1939E: 119, as *A. nigra* With.).

780/2(2)a. AGROSTIS GIGANTEA Roth. var. RAMOSA (S. F. Gray) Philipson. 17, Surrey; dried up bed of Fetcham Millpond, 1944, J. E. LOUSLEY, det. C. E. HUBBARD.

780/6k. AGROSTIS CANINA L. var. FASCICULARIS **(Curt.)** Sincl. 33, E. Glos.; heath on Greensand, Driffield, 1942, W. R. PRICE, det. C. E. HUBBARD. 37, Worcs.; Old Hills, Powick, 1937, F. M. DAY, det. C. E. HUBBARD. 43, Radn.; Llanfihangel nant Melan, 1936, F. M. DAY, det. C. E. HUBBARD.

*783/1. CALAMAGROSTIS EPIGEJOS (L.) Roth. 28, W. Norf.; dykeside at Snettisham, 1943, E. L. SWANN. 39, Staffs.; roadside near Hatherton, 1944, E. S. EDEES. *47, Mont.; near Forden Station, J. A. Webb (Wade and Webb, 1943: 68). 64, M.W. Yorks.; Hayton Wood, Aberford, 1943, W. A. Sledge: Red House Wood, Moor Monkton, 1891, H. J. Wilkinson (*Nat.*, 1944: 20). *110, O. Hebr.; S. Uist, J. W. H. Harrison *et al.* (1944: 116).

783/2. CALAMAGROSTIS CANESCENS (Weber) Gmel. em. Druce. 39, Staffs.; Chartley Moss, 1944, E. S. EDEES. 64, M.W. Yorks.; swampy wood by the stream between Copgrove and Newby, 1944, confirming another old record of the Rev. J. Dalton; the plant was abundant but non-flowering owing to shade, E. C. WALLACE.

785/1. APERA SPICA-VENTI (L.) Beauv. N. Hants.; waste ground in Basingstoke, 1943, N. E. G. CRUTTWELL. 63, S.W. Yorks.; field border north of Thorne, 1943, W. A. Sledge (*Nat.*, 1944: 20).

785/2. APERA INTERRUPTA (L.) Beauv. 28, W. Norf.; in some abundance on Roydon Common near King's Lynn on both sides of the track leading from Warren Farm over the heath: as a garden weed at North Wootton: on the sand-filled walls of King's Lynn fire-station (cf. Hubbard, 1936: *Proc. Linn. Soc. Sess. 148*), E. L. SWANN.

791/2. DESCHAMPSIA ALPINA (L.) R. & S. 98, Argyll M.; Ben Dothaidh, alt. 3000 ft., 1943, R. MACKECHNIE and E. C. WALLACE. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 119). 110, O. Hebr., S. Uist, J. W. H. Harrison (1941B: 267): also seen in Lewis (Griomaval) in 1939 by M. S. CAMPBELL and A. J. WILMOTT—confirms record doubted in *Top. Bot.*, ED.

*793/1. TRISETUM FLAVESCENS (L.) Beauv. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 304). *104, N. Ebudes; Eigg (only in one meadow), J. W. H. Harrison (1939E: 119).

†794/1c. AVENA FATUA L. var. GLABRATA Peterm. 4, N. Devon; Barton Down, A. L. Still, det. C. E. Hubbard; also var. *pilosissima* S. F. Gray and *A. fatua* × *sativa* (*Trans. Devon Ass. Adv. Sci.*, *75*, 59: 1943).

794/2. AVENA PUBESCENS Huds. 71, Man; the fisherman's path at the Ballabeg, Arbory, 1943, C. I. PATON, comm. A. J. WILMOTT.

†794/5b. AVENA LUDOVICIANA Durieu. 37, Worcs.; Birtsmorton, 1938, F. M. DAY, det. C. E. HUBBARD.

†794/6. AVENA STRIGOSA Schreb. 34, W. Glos.; one plant at Bromsberrow, 1942, F. M. Day (W. R. Price, 1943: *Proc. Cotteswold Nat.'s Club*, *28*, 8). 35, Mon.; edge of oatfield, "Warfields," Staunton Road, Monmouth, 1944, R. LEWIS, confirmed by C. E. HUBBARD: amongst beans in a field crop, Rumney, 1942, E. VACHELL. 41, Glam.; on heap of rubbish in large grass field, St Fagans, 1943, the first record for Glamorgan except as an alien on newly tipped ground at Cardiff Docks, E. VACHELL.

795/1b. ARRHENATHERUM ELATIUS (L.) **J. & C. Presl** var. BIARISTATUM (Peterm.) Druce. 20, Herts.; Sandy Lodge Road, Rickmansworth, 1944, F. M. DAY. 36, Heref.; near The Downs School, Colwall: Wellington Heath: both 1944, F. M. DAY, det. C. E. HUBBARD. 37, Worcs.; canal bank, Droitwich, 1944, F. M. DAY, det. C. E. HUBBARD. 41, Glam.; garden weed, Cardiff, 1943, A. E. WADE, comm. NAT. MUS. WALES.

*795/2. ARRHENATHERUM TUBEROSUM (Gilib.) Druce. *47, Mon.; Nantoer, J. A. Webb (Wade and Webb, 1943: 68).

*†808/1. CYNOSURUS ECHINATUS L. 19, N. Essex; lane side (with indigenous grasses) near Great Wigborough; several plants appearing established, 1944, J. A. WHELLAN. *47, Mont.; Llansantffraid, J. A. Webb (Wade and Webb, 1943: 68).

*809/1. KOELERIA GRACILIS Pers. *H.12, Wexford; Lady's Island, Miss E. BOOTH, comm. Miss E. RAWLINS (as *K. cristata*).

814/1. CATABROSA AQUATICA (L.) Beauv. 37, Worcs.; Underhill Farm, Little Malvern, first seen here 20 years ago and not seen again till 1944, F. M. DAY, det. C. E. HUBBARD.

818/1. MELICA NUTANS L. 39, Staffs.; Waterhouses, 1944, E. S. EDEES.

820/1. DESMAZERIA LOLIACEA (Huds.) Nym. 104, N. Ebudes; Rhum and Sanday, J. W. H. Harrison (1939E: 120, as *Festuca rottboelloides* Kunth).

*822/1. BRIZA MEDIA L. *103, M. Ebudes; Tiree, J. W. H. Harrison *et al.* (1941C: 304).

†822/3. Briza maxima L. 19, N. Essex; growing with *Cynosurus echinatus* L. at Great Wigborough and also appearing established, 1944, J. A. Whellan.

824/4. Poa irrigata Lindm. 98, Argyll M.; Ben Dothaidh and Ben Achaladair, 1943, R. Mackechnie and E. C. Wallace.

*824/5. Poa palustris L. 17, Surrey; dried up bed of Fetcham Millpond, 1944, J. E. Lousley. 21, Middx.; top of shelter in Hyde Park, 1944, W. J. L. Sladen, comm. J. E. Lousley, both confirmed by C. E. Hubbard. †98, Argyll M.; two plants in garden, Inveroran Hotel, Loch Tulla, 1943, R. Mackechnie and E. C. Wallace. *103, M. Ebudes; Coll and Tiree, J. W. H. Harrison *et al.* (1941C: 305). *104, N. Ebudes; Canna, J. W. H. Harrison (1939E: 120).

824/5b. Poa palustris L. var. effusa (Kit.) Asch. & Gr. 34, W. Glos.; withy bed, possibly native, Chaceley Stock, 1942, E. Nelmes, det. C. E. Hubbard.

824/10. Poa compressa L. 36, Heref.; wall of Grammar School, Ledbury, 1944, A. J. Wilmott. 64, M.W. Yorks.; old wall at North Deighton, 1943, E. C. Wallace (see *Nat.*, 1944: 20).

*824/11. Poa alpina L. *110, O. Hebr.; Allt Volagir, S. Uist, J. W. H. Harrison (1941B: 268).

*825/1. Glyceria maxima (Hartm.) Holmberg. *47, Mont.; Garthmyl, abundant here and there by the Shropshire Union Canal, J. A. Webb (Wade and Webb, 1943: 68)

825/2×3. Glyceria fluitans (L.) R. Br. × G. plicata Fr. 30, Beds.; Leagrave, 1941, J. G. Dony, det. C. E. Hubbard. 35, Mon.; boggy fields, Trelleck, 1943, R. Lewis, det. C. E. Hubbard. 36, Heref.; Holme Lacey, 1939; 37, Worcs.; Defford Common, 1936: both F. M. Day, det. C. E. Hubbard.

825/3(2). Glyceria declinata Bréb. 6, N. Som.; in boggy ground below Tyning's Farm near Shipham, 1942, E. J. Hamlin (W. Watson, *Som. Arch. and N.H. Soc. Proc.*, *88*, 111, 1943). 16, W. Kent; Wildernesse Park, Seal: Gilridge, near Penshurst: both 1944, J. H. Lavender and F. Rose.

825(2)/2. Puccinellia distans (L.) Parl. 34, W. Glos.; Frampton, 1942, Rev. R. B. Abell.

826/1d. Festuca rigida (L.) Kunth var. major (J. B. Presl). 17, Surrey; one patch under a beech tree near Leatherhead, 1942, N. Y. Sandwith (as *Scleropoa rigida* var. *major*).

*826/4(b). Festuca pratensis Huds. 30, Beds.; in arable field near Zonches' Farm, Dunstable, 1944, J. E. Lousley and E. Milne-Redhead, det. C. E. Hubbard. *104, N. Ebudes; Rhum, J. W. H. Harrison (1939E: 120).

826/4b×829/1. Festuca pratensis Huds. × Lolium perenne L. 17, Surrey; Chertsey Meads, 1943, J. R. Wallis.

*826/5. Festuca sylvatica Vill. *47, Mont.; Cwm Dulas, 6 miles south of Machynlleth, 1926, J. H. Salter, comm. Nat. Mus. Wales. *H.13, Carlow; woods at Ballintemple in R. Slaney, 1942, Miss E. Rawlins.

826/7a(2). Festuca rubra L. var. vulgaris Gaud. 35, Mon.; fields under cultivation previous year, Warfields, Staunton Road, Monmouth, 1943, R. Lewis, det. W. O. Howarth.

826/7b. Festuca rubra L. var. commutata Gaud. 28, W. Norf.; roadside at Roydon Common, 1944, E. L. Swann, det. C. E. Hubbard. 30, Beds.; Knotting, 1942, J. G. Dony, det. C. E. Hubbard (as *F. fallax* Thuill.).

826/7c. Festuca rubra L. var. dumetorum (L.) **Lej. & Court.** 28, W. Norf.; swamp margin at Leziate Fen, 1944, E. L. Swann, det. C. E. Hubbard (as var. *barbata* (Hack.)). 35, Mon.; fields under cultivation previous year, Warfields, Staunton Road, Monmouth, 1943, R. Lewis, det. W. O. Howarth.

826/7d. Festuca rubra L. var. megastachya Gaud. 28, W. Norf.; fixed shingle at Wolfreton Beach, 1944, E. L. Swann, det. C. E. Hubbard (as var. *grandiflora* Hack.).

826/7e. Festuca rubra L. var. pruinosa (Hack.) Howarth. 28, W. Norf.; fixed shingle at Wolfreton Beach, 1944, E. L. Swann, det. C. E. Hubbard.

826/7e(2). Festuca rubra L. var. glaucescens (Hegets. & Heer) Richt. 35, Mon.; grass verge, roadside, Staunton Road, Monmouth, 1943, R. Lewis, det. W. O. Howarth, who writes regarding the unusual habitat for this grass, "The only suggestion I can offer is that it has been introduced with commercial sand."

826/7h. Festuca rubra L. var. planifolia Hack. 35, Mon.; in cultivated garden, Staunton Road, Monmouth, 1944, R. Lewis, det. W. O. Howarth.

826/9b. Festuca ovina L. var. hispidula (Hack.) **Richt.** 33, E. Glos.; roadside on Welsh Way, between Bagendon and Baunton, 1942, E. Nelmes, det. C. E. Hubbard.

826/11. Festuca longifolia Thuill. 110, O. Hebr.; S. Uist, "referred with some hesitation to this species by Dr W. O. Howarth," Harrison *et al.* (1944: 116).

826/11b. Festuca longifolia Thuill. var. trachyphylla (Hack.). 30, Beds.; railway embankment west of Dunstable, 1944, J. E. Lousley and E. Milne-Redhead, det. C. E. Hubbard.

826/12. Festuca tenuifolia Sibth. 35, Mon.; on dry bank, "Warfields," Staunton Road, near Monmouth, 1944, R. Lewis, det. W. O. Howarth.

826/14b. Festuca glauca Lam. var. hebridensis Harrison. 103, M. Ebudes; Coll, J. W. H. Harrison (1940: 269), J. W. H. Harrison *et al.* (1941C: 305).

826/16b. Festuca ambigua Le Gall. 28, W. Norf.; on both sides of the track between Warren Farm and Roydon Common, 1944, so abundant that the reddish colouration of the rachis was most conspicuous even at a distance and for some way outlined the edges of the track, E. L. Swann: track over heath, Roydon Common, 1944, E. L. Swann (as *Vulpia ambigua*).

*827/3. Bromus sterilis L. *47, Mont.; frequent, Garthmyl, Montgomery, Newtown, Aberbechan and Kerrydale, J. A. Webb (Wade and Webb, 1943: 68).

[*]†827/5. Bromus madritensis L. [*]46, Card.; Aberystwyth, 1925, J. H. Salter, comm. Nat. Mus. Wales.

827/13. Bromus unioloides H. B. K. 28, W. Norf.; ash-tip at King's Lynn, 1944, E. L. Swann, det. C. E. Hubbard.

827/16b. Bromus secalinus L. var. hirtus (F. Schultz) Hegi. 4, N. Devon; Cove Hill, Tiverton, A. L. Still, det. C. E. Hubbard (*Trans. Devon Ass. Adv. Sci.*, *75*, 59: 1943). 17, Surrey; sandy cornfield near Royal Mills, Esher, 1943, J. E. Lousley and J. R. Wallis. 20, Herts.; near Rickmansworth, 1943, F. M. Day, det. C. E. Hubbard.

827/17. Bromus pratensis Ehrh. 37, Worcs.; Marsh Common, near Defford, 1936, F. M. Day, det. C. E. Hubbard (as *B. commutatus* Schrad.).

827/18. Bromus racemosus L. 36, Heref.; near Post Office, Coddington, 1937: Mathon, 1938: 37, Worcs.; near Mill Coppice, Cowley, Malvern, 1938: F. M. Day, det. C. E. Hubbard.

827/19b. Bromus hordeaceus L. var. glabratus (Döll.) Druce. 36, Heref.; Brock Hill, Colwall, 1944, F. M. Day, det. C. E. Hubbard.

827/19i. Bromus Thominii Hard. (all det. C. E. Hubbard). 3, S. Devon; Cliffords Bridge, Moreton Hampstead, 1936, F. M. Day: also "intermediate between *B. lepidus* Holmb. and *B. Thominii*" at Monk's Bridge, Brixham, 1938, F. M. Day. 30, Beds.; Knotting, 1944, E. Milne-Redhead and J. G. Dony: Burton, 1944, J. G. Dony. 35, Mon.; fields under cultivation previous year, Warfields, Staunton Road, Monmouth, 1943, R. Lewis. 36, Heref.; Evendine, Colwall, 1944, F. M. Day. 37, Worcs.; Diglis Lock, Worcester, 1941: Wells Common, Malvern, 1944; both F. M. Day: roadside at British Camp Reservoir, Little Malvern, 1944, F. M. Day, of which C. E. Hubbard writes "hairy spiculate form—*B. hordeaceus* forma *hirsutus* Holmb."

*827/19(2). Bromus lepidus Holmberg (as n. 30 in *C.F.*). 7, N. Wilts.; Stone Pit Hill, near Devizes, 1942 (*Rep. Marlb. Coll. N.H.S.*, *No. 91* (1943) 12). 28, W. Norf.; West Newton, 1944; frequently met with on arable land north of King's Lynn chiefly on chalk and from the nature of its habitat most likely introduced with seed, E. L. Swann: arable land at West Newton, 1944, E. L. Swann, det. C. E. Hubbard. 33, E. Glos.; Stanway, Cotswold Hills, 1938, F. M. Day, det. C. E. Hubbard. *35, Mon.; Hadnock Farm, near Monmouth, 1942, S. G. Charles, comm. Nat. Mus Wales: fields under cultivation previous year, Warfields, Staunton Road, Monmouth, 1943, R. Lewis, det. C. E. Hubbard. 36, Heref.; Colwall, 1943, F. M. Day, det. C. E. Hubbard. 64, M.W. Yorks.; field border, Camblesforth Common, 1943, W. A. Sledge (*Nat.*, 1944: 20).

*828/2. Brachypodium pinnatum (L.) Beauv. *67, Northumb. S.; in two places on the moor and in fields at East Bolton, near Alnwick, W. A. Clark (1942: *Vasc.*, *27*, 8).

†829/4b. Lolium multiflorum Lam. var. italicum (A. Br.). 47, Mont.; Derwenlas, Garthmyl and Ffrwd Mawr, J. A. Webb (Wade and Webb, 1943: 68).

*830/2. Agropyron pungens **(Pers.)** R. & S. *104, N. Ebudes; Canna, the var. *aristatum* Hack. on Rhum and Canna. J. W. H. Harrison (1939E: 121).

830/4b. Agropyron repens L. var. dumetorum (Hoffm.) S. F. Gray. 35, Mon.; near Pen-twyni, St Mellons, 1944, A. E. Wade.

830/4d. Agropyron repens L. var. Vaillantianum (Schreb.) Schrank. 35, Mon.; Llandegveth, 1943, A. E. Wade.

830/4e. Agropyron repens L. var. lasiorachis Hack. 35, Mon.; St Mellons, 1944, A. E. Wade.

830/4i. Agropyron repens L. var. caesium (Presl) Beck. 35, Mon.; near Hendre Hall, St Mellons, 1944, A. E. Wade.

830/4j. AGROPYRON REPENS L. var. SUBULATUM (Schreb. ex Schweigg. & Koerte) R. & S. 35, Mon.; Abergavenny, 1944, A. E. WADE.

834/1. NARDUS STRICTA L. 30, Beds.; Rushmere, Heath and Reach, 1944, C. E. HUBBARD and J. G. DONY. 33, E. Glos.; heath on Greensand, Driffield, 1942, W. R. PRICE.

835/2. HORDEUM MURINUM L. 64, M.W. Yorks.; roadside waste south end of Ripon, 1943, a rare plant in v.-c. 64, E. C. WALLACE.

836/3. ELYMUS EUROPAEUS L. 20, [Beds.]; Long Wood, Studham, 1941, J. G. DONY.

844/2c. EQUISETUM ARVENSE L. var. NEMOROSUM Braun. 41, Glam.; under trees, Mynydd-y-Glew, 1936, sterile stems very tall, branches spreading and lax, E. VACHELL.

844/2e. EQUISETUM ARVENSE L. var. DECUMBENS G. Meyer. 41, Glam.; cultivated field, Llandaff North, 1942, the variety new to the vice-county, E. VACHELL.

*844/3. EQUISETUM SYLVATICUM L. 14, E. Suss.; near Ordnance Place, Mayfield, 1943, J. R. WALLIS. *35, Mon.; grassy bank, roadside, Grosmont Woods, near Grosmont, 1944, R. LEWIS, confirmed by A. E. WADE, who writes:—" The only previous record for this is one made about eighty years ago at Varteg."—Add to *C.F.*

844/3b. EQUISETUM SYLVATICUM L. var. CAPILLARE Hoffm. 47, Mont.; Llandinam, J. A. Webb (Wade and Webb, 1943: 68).

844/4. EQUISETUM PRATENSE Ehrh. 98, Argyll M.; rock ledges on Meall Buidhe, Achaladair, 1943, E. C. WALLACE.

*844/7. EQUISETUM HYEMALE L. *104, N. Ebudes; a single clump in a sheltered situation, Allt Beinn nan Stac, Rhum, R. B. Cooke (1944: *Vasc.*, *29*, 6).

*850/1. PHYLLITIS SCOLOPENDRIUM (L.) Newm. *110, O. Hebr.; new to S. Uist, Harrison *et al.* (1944: 116).

851/2. ASPLENIUM TRICHOMANES L. 30, Beds.; well established on sides of lake, Woburn Park, 1944, E. MILNE-REDHEAD and J. G. DONY.

*853/3. ATHYRIUM FLEXILE Syme. *98, Argyll M.; a few plants among rocks low on Meall Buidhe, Achaladair, 1943, E. C. WALLACE.

854/1. POLYSTICHUM SETIFERUM (Forsk.) Woynar. 64, M.W. Yorks.; Hackfall and Mackershaw near Ripon, both 1943, E. C. WALLACE (see *Nat.*, 1944: 20).

856/7. Dryopteris Oreopteris (Ehrh.) Maxon. 15, E. Kent; still at Willesborough Leas, 1944, last recorded thence by Cowell (1839: *Floral Guide* 69 as *Aspidium Oreopteris*), F. Rose.

*857/4. Cystopteris Filix-fragilis (L.) Bernh. *9, Dorset; " in a thickly wooded swamp, on dead tree trunks," Bryanston Park, Blandford, 1944, H. Bury and H. G. Sadler, comm. A. J. Wilmott.

*866/1. Ophioglossum vulgatum L. *103, M. Ebudes; Coll, Tiree. and Gunna, J. W. H. Harrison *et al.* (1941C: 307). 104, N. Ebudes; Rhum: Eigg: Hyskeir: J. W. H. Harrison (1939E: 122).

*869/1. Isoetes lacustris L. *47, Mont.; Llyn du, J. A. Webb (Wade and Webb, 1943: 68).

870/5. Lycopodium clavatum L. 16, W. Kent; abundant on heathy ground, mixed with the mosses *Hypnum Schreberi* and *Polytrichum formosum*, near Bedgebury State Forest: also seen within the Forest: the first Kent records for many years, both 1943, J. Burgess; shown to F. Rose, 1944, comm. F. Rose. [J. P. M. Brenan found a single plant in the " pinetum " area at Bedgebury some years ago but thought it was probably introduced with conifers—*in litt.* to J. E. Lousley]. 35, Mon.; on heathy bank in wood, between St Arvans and Devanden, 1944, R. Lewis.

872/3. Nitella flexilis Ag. 41, Glam.; Aberdulais, 1938, second locality for the vice-county (the record in 1937 Rep., 597, an error, see 1939 Rep., 306), det. G. O. Allen, who writes " must, I think, be *N. flexilis*. It does not look at all like *N. opaca*, and from what I could make out it fits in well with *N. flexilis* "; E. Vachell.

873/1. Tolypella intricata Leonh. 23, Oxon.; ditch near Oxford, 1943, J. P. M. Brenan.

876/3. Chara vulgaris L. 41, Glam.; canal near Whitchurch, September 1943, E. Vachell, det. G. O. Allen.

876/3b. Chara vulgaris L. var. longibracteata Kütz. 41, Glam.; Baglan marshes, July 1935, E. Vachell, det. G. O. Allen.

*876/5. Chara hispida L. 41, Glam.; Glamorganshire Canal at Whitchurch, 1943, det. G. O. Allen; one old record from Crymlyn (Crumlin) Bog (*Bot. Guide*, 1805); " remove brackets in *Glamorgan Plant List*, p. 178 "—E. Vachell; add to *C.F.* but see *1933 Rep.*, 741.

876/7. Chara contraria Kütz. 41, Glam.; Lily Pool, Duffryn Gardens, St Nicholas, September 1942, E. Vachell, det. G. O. Allen (and in Kenfig Pool, April 1935, det. G. O. Allen, where it had been recorded by H. J. Riddelsdell).

876/11. Chara aculeolata Kütz. 63, N.E. Yorks.; Balne Pond, J. M. Taylor (*Nat.*, 1945: 25).

THE WEATHER OF 1943 AND 1944 AND ITS EFFECTS.

(Adapted by permission from the Phenological Reports of the Meterological Society, with additional information supplied by Miss Lewis of the Meteorological Office and others. Mention of a county indicates merely the source of the statement and does not exclude other counties.)

1943.

After a brief cold spell in January the temperature from February to mid-June (except for a week at the beginning of April) was never below, and often several degrees above, the average. After the mild winter the ash flowered very abundantly (Somerset) and fruited heavily (Wilts.). High winds in April and early May damaged young foliage in exposed places, and the accompanying snow in the north destroyed blossom. A gale did damage to trees and the apple crop suffered locally (Somerset). June was sunless and dry, until a sunny period at the end of the month and early in July: pastures in eastern and midland counties were burned and root crops were affected. After this the weather was unsettled and fluctuating until mid-August except for a short heat-wave at the end of July, terminated by widespread thunderstorms. The second half of August was dry in the south and wet in the north. The harvest generally was good, with wheat above the average; it was early in the Midlands, East Anglia and Kent, damaged by rain in the south-west and in Wales, and held up and somewhat damaged in the north of England and in Scotland. Wild fruits also often gave a heavy crop (in Wilts. especially sloes and bullaces). It was a remarkable summer after an early flowering, with some second flowerings in the autumn.

1944.

After a rather cold December, 1944 opened with a warm period till mid-February (except for brief cold spells). There was heavy snow in Scotland at the end of February. Then it was cold and dry until the beginning of April (with three short warm spells), but mostly less cold in the north-east and north-west. April was warm and wettish (especially in the north) after which, except for a short period in the north, it continued dryish until the end of June in England and Ireland. The absence of frost left plants forward (in Cheshire the Horse Chestnut was noted in flower on 30th April and gooseberries were eaten on 11th May: Major J. W. Campbell). May had some cold snaps, which locally did much damage to fruit, especially to plums and apples in East Anglia. In Scotland May was in general wet, especially in the west. June was wetter in Scotland than in England. July was dull, with rainfall in England above the average during the first half, in north-west Scotland rather deficient, and in northern Ireland excessive. The rest of September was rather cool and dry in England, less wet than average in the west of Scotland but excessively rainy elsewhere, continuing so through October and most of November. In England October started cold and dry, but ended wet and stormy. Frost occurred early in November. Harvest conditions by early August were excellent, but broken weather did considerable damage where the crops were less forward.

A. J. WILMOTT.

NOTES ON THE FLORA OF OXFORDSHIRE AND BERKSHIRE.

J. P. M. Brenan, M.A.

The following notes are mainly a result of the writer's botanising since 1936 in the counties of Oxfordshire and Berkshire, especially in those parts in the neighbourhood of the city of Oxford. Some of the more interesting records have already been dealt with in previous Reports of the Society, and will not be mentioned again here, except in a few instances where additional information is given.

Though both counties must be considered as botanically well-worked, and the second edition of Druce's *Flora of Oxfordshire* was published as recently as 1927, the additions since made and the changes already discernible emphasise both the amount of work yet to be done and the often repeated fact that the vegetation of any area is not static but dynamic. The field-botanist who has explored any considerable tract over a term of years does not fail to notice the constant changes, some slow and sometimes barely perceptible, usually caused by natural means, others rapid and often extensive, usually by the agency of man; he observes the appearance of newcomers and too often has to mourn the extinction of cherished rarities. It seems appropriate to dwell on this aspect now, as the last few years have witnessed changes in the vegetation of this country perhaps greater than any that have been previously accomplished in so short a time; from the botanist's point of view they have been rarely for the better. Military installations and edifices, frequently occupying considerable tracts of countryside, have grown up as it were like fungi during the night. The botanist cannot disregard also the mania for indiscriminate ploughing that has affected enormous areas. The propagandist may magnify the importance of each grain of corn; others will with reason wonder whether the sparse and feeble crop, so encumbered with weeds as to be scarcely worth the reaping, that is too often the sorry result of such activity, is an adequate recompense for the industry expended upon it or for the value and interest of that which it has irrevocably destroyed. Among the tasks of the field-botanist in many areas during the coming years will be the assessment of the effect of such recent changes on the flora; it is yet too early to calculate their full effect; it seems certain that it will be considerable.

I must here give my very grateful thanks to those who have assisted in the determination of various critical groups:—Dr P. Aellen (*Chenopodium*), Mr C. E. Hubbard (*Gramineae*), Mr J. E. Lousley (*Rumex*, *Cirsium*), Mr E. Nelmes (*Carex*), the late Mr A. L. Still (*Mentha*), Mr W. Watson (*Rubus*); also to Prof. T. G. B. Osborn for permission to use the library of the Oxford University Department of Botany and to Dr N. Polunin for facilities in consulting Herb. Druce and Herb. Fielding. My gratitude is also due to the Rev. N. E. G. Cruttwell, Dr J. N. Mills and others for their companionship and assistance on various excursions; especially too is it due to Mr R. Burn, with whom I have enjoyed numerous botanical hunts in the last few years; the following pages will bear witness to his diligence and enthusiasm, and to the extent of my indebtedness to Mr Burn.

In the interest of space the following abbreviations of recorders' names are employed:—J.N.M. = J. N. Mills; J.P.M.B. = J. P. M. Brenan; N.E.G.C. = N. E. G. Cruttwell; N.Y.S. = N. Y. Sandwith; P.G.B. = P. G. Beak; R.B. = R. Burn. Where no recorder is given, the writer is alone responsible.

The abbreviation " (sp.) " given after the date indicates that a voucher specimen is preserved in the writer's herbarium (Herb. Brenan). Only of a few obvious and non-critical plants were no specimens taken.

The records are arranged under their appropriate vice-counties:—Berkshire (" 22, Berks.") and Oxfordshire (" 23, Oxon."). The numbers between 1 and 7 preceding records refer to the botanical districts, under which the records in the following pages are arranged serially. The districts for Berkshire are defined in the introduction to Druce's *Fl. Berks.*, 1897, and there is a map illustrating them at the end of that work; those for Oxfordshire are defined in the introduction to the second edition of Druce's *Fl. Oxfordsh.*, 1927.

It would be unfitting to close without recalling the debt that all field-botanists working in these counties must owe to the late Dr G. C. Druce, and to pay tribute to the thoroughness of his botanical explorations in this district.

1/1. CLEMATIS VITALBA L. 23, Oxon. 5. From Burford to the Gloucestershire border, 1938.

5/1. MYOSURUS MINIMUS L. 22, Berks. 2. Cornfield between Cholsey and Wallingford, 1937 (sp.), N.Y.S. and J.P.M.B. 23, Oxon. 6. Sandy field under corn or clover near Nuneham Courtenay, 1937 and subsequently (sp.).

6/9. RANUNCULUS ARVENSIS L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.). 6. Cornfield between Chalgrove and Stadhampton, 1937 (sp.).

6/33. RANUNCULUS FICARIA L. 23, Oxon. 6. One plant on a track through a patch of woodland on the S.W. side of Shotover with flowers all " double," the stamens being narrow, yellow and petaloid, 1943 (sp.), Dr N. POLUNIN & J.P.M.B.

35/1b. NASTURTIUM OFFICINALE R. Br. var. SIIFOLIUM Rchb. 23, Oxon. 5. Roadside stream at Westwell, 1937 (sp.).

†35/4. RORIPPA ISLANDICA (Oeder) Borbás. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938.

39/2. CARDAMINE AMARA L. 23, Oxon. 6. Shillingford, 1938, R.B. & J.P.M.B.; Preston Crowmarsh near Benson, 1938, N.E.G.C. & J.P.M.B.

†42/10. Alyssum maritimum (L.) Lam. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937. 5. Waste ground, Port Meadow, Oxford, 1941, J.N.M. & J.P.M.B. 6. Waste ground, Jackdaw Lane, Oxford, 1938.

†47/2. Hesperis matronalis L. 22, Berks. 2. Waste ground near Kennington, 1938 (sp.). 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford!, 1938, found by N.E.G.C.

†49/2. Sisybrium Sophia L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1939.

†49/4. Sisymbrium orientale L. 23, Oxon. 5. Railway bridge, Wolvercote, 1938; waste ground, Burford, 1938 (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1938.

†49/5. Sisymbrium Irio L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1938.

49/6b. Sisymbrium officinale (L.) Scop. var. leiocarpum DC. 23, Oxon. 4. Manor Road, Oxford, 1938.

†50/1. Erysimum cheiranthoides L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938. 7. By the waterworks, Lambridge Wood near Henley, 1940, J.N.M. & J.P.M.B.

†52/1. Camelina sativa (L.) Crantz. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.). 5. Waste ground, Port Meadow, Oxford, 1941.

†52/2. Camelina Alyssum (Mill.) Thell. 22, Berks. 2. Very sparsely in a field of flax ¾ mile N.E. of Pusey village, 1943 (sp.), R.B. & J.P.M.B.

54/14. Sinapis arvensis L. (*Brassica kaber* (DC.) Wheeler). 23, Oxon. 6. A single large plant showing a very curious modification of the siliquas occurred by the roadside not far from Shepherd's Quarry, about ⅔ mile from Stanton St John towards Headington, 1942 (sp.), R.B. & J.P.M.B. In many, but not all, of the siliquas on this plant both sutures are expanded at the base of the beak into a very narrow, longitudinal, hyaline or pale green wing; each wing bearing on its outer margin a single, very small, divaricate cusp up to about 1.25 mm. long, the position of this cusp being usually opposite or slightly below the single seed in the beak. The pods thus appear to be each equipped with a pair of tiny horns. So far I have found no mention of this peculiarity in published literature, nor has it been observed on other plants of *Sinapis arvensis* examined. It will be of interest to learn whether botanists have noticed this form elsewhere.

†54/16. Brassica juncea (L.) Coss. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.). 5. Waste ground by a railway bridge near Yarnton, 1941; waste ground, Port Meadow, Oxford, 1939-41 (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1938-9 (sp.).

†54/20. Brassica gallica (Willd.) Druce. 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1940 (sp.).

†61/20. Lepidium virginicum L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.).

†61/22. Lepidium densiflorum Schrad. 23, Oxon. 5. Waste ground, St Ebbe's, Oxford, 1937 (sp.).

†61/28. Lepidium bonariense L. 23, Oxon. 4. In a field of rye-grass near Sturdy's Castle, 1936 (sp.).

†64/2. Thlaspi perfoliatum L. 23, Oxon. 4. A single large plant on the sandy edge of a cornfield by the footpath from Headington to Stow Wood, 1941 (sp.), J.N.M. & J.P.M.B. A very curious and unexpected find, which must surely be attributed to recent introduction from some distant locality, since it is scarcely conceivable that so marked a plant could have hitherto escaped the sharp eyes of the generations of botanists who have sampled the riches of the Headington Wick neighbourhood. Its occurrence here is difficult to explain; no other obvious aliens were observed among the neighbouring corn, and the nearest native locality for *T. perfoliatum* is some miles distant, so that a wind-borne arrival is hardly feasible. Perhaps we must invoke a seed dropped from the vasculum of an itinerant botanist!

†74/2. Bunias orientalis L. 22, Berks. 1. One plant on a roadside near Botley Pound, 1943-4, R.B. & J.P.M.B. 23, Oxon. 7. Field near Berinshill Wood, Ipsden, 1939 (sp.), J. F. G. Chapple & J.P.M.B.

†85/1. Reseda alba L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.).

88/10. Viola calcarea Greg. 23, Oxon. 5. Quarry near Cornbury, 1938 (sp.).

88/15b. Viola variata Jord. var. sulphurea Drabble. 22, Berks. 2. Field between Cholsey and Wallingford, 1937 (sp.). 3. In a sainfoin field on the chalk between Streatley and Moulsford Downs, 1937 (sp.).

†95/2b. Saponaria Vaccaria L. var. grandiflora Fisch. 22, Berks. 2. Waste ground by roadside near Bradley Farm between Cumnor and Wootton, 1939 (sp.).

†98/9. Lychnis Githago (L.) Scop. 22, Berks. 1. With very pale pink, almost white, flowers in a field of planted vetches N.W. of Fyfield, 1941 (sp.), N.Y.S. & J.P.M.B.

100/2. Cerastium arvense L. 23, Oxon. 4. Some patches of this plant on the grassy verge of the by-pass road between Marston and Headington, 1943-4.

100/8. Cerastium semidecandrum L. 23, Oxon. 6. Dyke Hills, Dorchester, 1938, R.B. & J.P.M.B.

101/7. Stellaria graminea L. J. W. White (*Fl. Bristol*, 193, 1912) draws attention to dimorphic flowers in this species. In June

1944 large and small flowered plants were seen plentifully on the grassy margin of a track near Noke Wood (23, Oxon., district 4) by R.B. & J.P.M.B. (sp.). The large flowered plants were hermaphrodite with well developed stamens and styles, as indicated by White; the small flowered plants had apparently well developed stamens but very minute styles less than 0.5 mm. long. White, however, describes the small flowered plants as having dwarf stamens and very prominent styles; so that the species is possibly trioecious; however, the small flowered plants at Noke Wood apparently all had their flowers infected by a smut, so that it is possible that the condition described is merely a pathological response. In other localities in this neighbourhood the two forms similar to those at Noke Wood were again observed, together with small flowered plants with prominent styles and reduced stamens, agreeing with those described by White. These latter were, however, not all identical, for while some plants had all the stamens uniformly dwarfed, in others the antesepalous stamens were twice as large as the antepetalous. This may perhaps be regarded as an intermediate condition between the hermaphrodite and the female forms, possibly due to crossing. In one instance the antesepalous whorl was only partly enlarged. In addition the degree of smallness of the corolla was not uniform. The demarcation of the sexual forms seems thus to be not very definite, and a study of the genetical mechanism underlying these differences should present a problem well worth investigation. It may be suspected that the varieties based on flower size by continental botanists have been made with perhaps insufficient regard for the possibly trioecious behaviour of this species and its correlation with petal length (see Graebner in Asch. & Graebn., *Syn. Mitteleur. Fl.*, *5* (*1*), 556-7, 1917).*

†108/2. CLAYTONIA PERFOLIATA Donn. 23, Oxon. 6. Established about the Palace at Cuddesdon, 1940, where it was shown to me by N.E.G.C.

112/8. HYPERICUM HIRSUTUM L. 23, Oxon. 5. Several plants showing a striking colour variation in the flowers (petals almost white, with a faint yellowish-green tinge, stamen filaments

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*Since the above was written, my attention has been drawn by Mr J. E. Lousley and Dr W. B. Turrill to a paper on floral variability in this species by Horne, in *New Phyt.*, *13*, 73-82, 1914. On a basis of observations made on some thousands of individuals, he tabulates the corolla measurements of male-sterile and hermaphrodite flowers and demonstrates that there is considerable variation in corolla diameter and width of petal lobes in each of the two sexual groups. He concludes that the flowers with the largest and smallest corollas are usually hermaphrodite and male-sterile respectively, and that those with intermediate-sized corollas may belong to either group or else be sexually intermediate. In connection with these latter he notes the occurrence of heteromorphic stamens in one and the same flower.

same colour as petals, anthers orange) were growing among a normally coloured multitude of *H. hirsutum* in Burleigh Wood near Bladon, 1942 (sp.), R.B. & J.P.M.B. Mr N. Y. Sandwith writes (*in litt.*) that he has twice seen this colour-form of *H. hirsutum*—on Mickleham Downs and with Mr H. W. Pugsley in an Essex wood—and a similar one of *H. quadrangulum* L. (*H. tetrapterum* Fr.) in Dorset.

112/12. HYPERICUM DUBIUM Leers. 22, Berks. 2. On loamy soil among coarse grass, Buckland Warren N. of Hatford, 1942 (sp.), P.G.B. & J.P.M.B. 23, Oxon. 5. Burleigh Wood near Bladon, 1942 (sp.), R.B. & J.P.M.B.

†115/1. ALTHAEA OFFICINALIS L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1940-42 (sp.).

†117/1. MALVA MOSCHATA L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.). This plant had white flowers and was otherwise untypical.

117/2. MALVA SYLVESTRIS L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1939 (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.). In both localities with white flowers.

Var. LASIOCARPA Druce. 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1944 (sp.), A. P. D. Jones & J.P.M.B. 6. Waste ground, Sandford Lock, 1941 (sp.).

127/14. GERANIUM ROBERTIANUM L. 23, Oxon. 6. Several plants with white flowers in and near a hedge by the river bank close to Iffley Lock, 1944, N.E.G.C. & J.P.M.B. Specimens from this locality are in Herb. Cruttwell.

†128/2. ERODIUM MOSCHATUM (Burm.) L'Hérit. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.).

†133/3. IMPATIENS PARVIFLORA DC. 22, Berks. 1. Abundant by a stream in Long Copse on Cumnor Hill, 1940-43. 23, Oxon. Evidently increasing rapidly in the city of Oxford. It is a troublesome weed in some gardens along the Banbury Road, where it occurs in abundance.

147/3. GENISTA TINCTORIA L. 23, Oxon. 4. Otmoor, plentiful in one part, 1937. 6. Meadow on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

†153/5. MEDICAGO ARABICA (L.) All. 23, Oxon. 5. One patch on grassy ground by a gravel pit between Sutton and South Leigh, 1943 (sp.), R.B. & J.P.M.B. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.). The plant from the last-named locality is remarkable in that, while some of the pods are normal, most are falcate, not spirally twisted, quite unarmed, and up to 1 cm. long, in general appearance not unlike those of some species of *Trigonella*. The epithet *unguiculata* has been bestowed on what is apparently a similarly monstrous condition of *M. lupulina*. As in many inland counties, *M. arabica* is a very rare plant in Oxfordshire; Druce (*Fl. Oxfordsh.*, ed. 2, 107) gives no recent records.

153/7e. Medicago lupulina L. var. Willdenowiana Koch. 23, Oxon. 6. A specimen collected by Mr P. D. Abbott in 1941 at Stadhampton has been shown to me by Mr R. Burn.

†154/4. Melilotus indica (L.) All. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938. 6. Waste ground, Jackdaw Lane, Oxford, 1938-42.

155/2. Trifolium pratense L. 22, Berks. 2. Roadside bank, Pusey, 1942 (sp.), P.G.B. & J.P.M.B. An interesting monstrosity in which several of the calyces in each inflorescence bear, not single flowers, but smaller secondary inflorescences; these are congested and give the main capitula an irregularly lobed appearance. It may be better described as a contracted " hen and chickens " condition.

†155/19. Trifolium agrarium L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1940 (sp.), N.E.G.C. & J.P.M.B.

†176/5. Vicia villosa Roth. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.).

†176/6. Vicia dasycarpa Tenore. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.).

†176/25. Vicia narbonensis L. 23, Oxon. 4. One plant seen on waste ground, Manor Road, Oxford, 1938.

†176/26b. Vicia pannonica Crantz var. purpurascens (DC.) Ser. in DC. 22, Berks. 1. In a field of planted vetches N.W. of Fyfield, 1941 (sp.), N.Y.S. & J.P.M.B.

†178/18. Lathyrus cicera L. 22, Berks. 1. In a field of planted Vetches N.W. of Fyfield, 1941 (sp.), N.Y.S. & J.P.M.B.

185. Rubus. All determined by W. Watson.

185/40(3). Rubus rhodanthus W. Wats. 22, Berks. 2. Heathy ground among bracken, Hen Wood on Boar's Hill, 1942 (sp.), P.G.B. & J.P.M.B. 23, Oxon. 6. Plentiful in open bushy ground among bracken, Horsepath Common, 1943 (sp.).

185/45. Rubus Winteri Focke. 22, Berks. 2. Bushy ground near wood border in an exclosure on Boar's Hill, 1942 (sp.), P.G.B. & J.P.M.B.

185/46(2). Rubus cuspidiferus Lef. & Muell. 22, Berks. 2. Plentiful near the fen at Cothill, 1943 (sp.), R.B. & J.P.M.B.

185/93. Rubus rudis Weihe. 23, Oxon. 6. In moderate shade by a green lane between Shotover and Wheatley near Horsepath Common, 1941 (sp.).

185/125. Rubus rufescens Lef. & Muell. 23, Oxon. 7. Lambridge Wood near Henley, 1940 (sp.), R.B. & J.P.M.B.

185/129(2). Rubus adenolobus W. Wats. (*R. Koehleri* Weihe var. *cognatus* (N. E. Br.) Rogers). 22, Berks. 2. Bushy ground in an exclosure on Boar's Hill, 1942 (sp.), P.G.B. & J.P.M.B.

185/151c. Rubus corylifolius Sm. var. conjungens Bab. 22, Berks. 2. Buckland Warren near Hatford, 1942 (sp.), P.G.B. & J.P.M.B.

187/2. GEUM RIVALE L. 23, Oxon. 4. In vast profusion in the lower-lying part of Woodeaton Wood, near Woodeaton, 1943 (sp.), R.B. & J.P.M.B.

Var. PALLIDUM (Fisch. & Mey.) Blytt, *e desc.* 23, Oxon. 4. Several patches of this among the normal plant in one part of Woodeaton Wood, 1943 (sp.), R.B. & J.P.M.B. This is an exceedingly striking colour-variant. Comparison with the normal plant in the fresh condition showed that it could be explained by assuming a complete absence or suppression (except at the extreme base of the stem and on the petioles of the radical leaves) of the purple pigment that is so conspicuous in normal *G. rivale*. This results in the following differences from the normal plant:—The styles are wholly green, not purple-tipped (this is especially noticeable when, after the fall of the petals, the styles elongate greatly, and in the normal plant the deep purple colour extends to the style base, while here the styles remain green); the petals are uniformly pale yellow, without the pink or purple tinge of normal *G. rivale*; the calyx is pale green, not deep purple; the pedicels, stems and the nerves on the lower side of the upper leaves are likewise green.

Mr N. D. Simpson has made (*in litt.*) the interesting suggestion that this plant may represent *G. rivale* offspring from a previous cross between *G. urbanum* and *G. rivale*, the genotype of the offspring having become upset on segregation. Mr Simpson cites examples of such effects following hybridisation in cottons (*Gossypium*). This, of course, is a perfectly feasible explanation, especially as crosses between the two species were observed in Woodeaton Wood; but it seems also at least quite possible that the effect could be produced by a mutation, perhaps only affecting one gene, of normal *G. rivale*.

A decision between these theories can hardly be made without cultivation and experiment. As far as the external morphology of the plant is concerned, no differences from normal *G. rivale*, other than those already mentioned, could be seen, and from the taxonomic standpoint it seems reasonable to leave it under *G. rivale*.

Apparently similar plants have been collected elsewhere. In Herb. Druce there is a gathering made in E. Lothian by S. Anderson in 1910 (see *B.E.C. 1910 Rep.*, 500, 1911); the collector, however, describes (*in. litt.*) the flowers as " green." Mounted with the last is a fragment of what looks like normal *G. rivale*. There is also an " albino " form collected by W. R. Linton on June 11th, 1907, at Stanton, Staffs. (see *B.E.C. 1907 Rep.*, 288, 1908); a sheet of this in Herb. Druce appears to agree with the Woodeaton plant. F. Buchanan White (*Fl. Perthsh.*, 126, 1898) refers to plants " with much paler foliage and greenish-white flowers " from Glen Farg, and suggests that they are perhaps var. *pallidum*.

187/2×1. GEUM RIVALE L. × URBANUM L. 23, Oxon. 4. Scattered thinly among the parent species in Woodeaton Wood, 1943 (sp.), R.B. & J.P.M.B.

189/8×7. POTENTILLA PROCUMBENS Sibth. × REPTANS L. (×P. MIXTA Nolte). 23, Oxon. 5. With the parent species in Burleigh Wood near Bladon, 1942 (sp.), R.B. & J.P.M.B. This agrees with specimens in Herb. Druce determined by Th. Wolf, the monographer of the genus.

191/2. AGRIMONIA ODORATA (Gouan) Mill. 22, Berks. 1. Plentiful in woodland on the S. side of Wytham Hill below Radbrook Common, 1944, Dr E. W. JONES & J.P.M.B. 23, Oxon. 6. Coombe Wood near Cuddesdon, 1940 (sp.), N.E.G.C. & J.P.M.B. There is a record on Holliday's authority for this species from Coomb (*sic*) Wood given in Druce's *Fl. Oxfordsh.*, ed. 2, 156, but the locality is placed in district 5. I suspect that Holliday's record does refer to the Cuddesdon wood, which is spelt " Coomb " elsewhere in the flora, but that it was referred to the wrong district, possibly through confusion with the village of Combe, which is in district 5. The spelling " Coombe " for the Cuddesdon wood is that adopted on the one-inch Ordnance Survey map.

199/17. SAXIFRAGA GRANULATA L. 23, Oxon. 5. Quarry near Stonesfield, 1944, Dr A. R. CLAPHAM & J.P.M.B.

†211/10. SEDUM DASYPHYLLUM L. 23, Oxon. 4. Islip.

†220/7(2). EPILOBIUM ADENOCAULON Hausskn. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1940 (sp.). Previously recorded for the county only from Cassington (*B.E.C. 1938 Rep.*, 41, 1939).

220/8. EPILOBIUM ROSEUM Schreb. 23, Oxon. 5. Plentiful in Burleigh Wood near Bladon, 1942, R.B. & J.P.M.B.

†227/1. **Blumenbachia Hieronymi** Urban. This striking adventive species belonging to the family *Loasaceae* has been twice recorded on waste ground in Britain. The first alleged occurrence was on rubbish at Marston Brickyards, Oxon., in 1909, where it was found by the late Dr Druce, who published the record in *B.E.C. 1910 Rep.*, 502, 1911, as *B. insignis* Schrad., and repeated it in *Fl. Oxfordsh.*, ed. 2, 187, 1927. The second was at Jackdaw Lane, Oxford, in 1938, where it was found by Mr J. F. G. Chapple and the writer; plants from Jackdaw Lane were distributed through the Exchange Club by Mr Chapple under the reference No. 38339 (see *B.E.C. 1938 Rep.*, 193, 1942).

It was thought at first that the Jackdaw Lane plant was *B. insignis*, but further investigation showed that this was wrong, and that it was referable to the closely related *B. Hieronymi* Urban in *Jahrb. Königl. Bot. Gart. Mus. Berl.*, *3*, 249-50, 1884. The unfortunate distribution of this plant under an incorrect name was doubtless due to the peculiar difficulties that attended that distribution, the report of which was edited in Mr Chapple's absence; it should be noted that Mr Chapple had written up his own specimen correctly as *B. Hieronymi*. Recipients of this plant through the Exchange Club should therefore note this alteration of name on their specimens.

The original record from Marston Brickyards is backed by a specimen in Herb. Druce; though it is rather poor and scrappy it is sufficient for there to be no doubt that it and the Jackdaw Lane plant are conspecific. There is thus no evidence for the occurrence of *B. insignis* Schrad. in Britain, and the latter name must therefore relinquish its place in the *British Plant List* and be replaced by *B. Hieronymi* Urb.

B. Hieronymi is a native of the Argentine, and was based on specimens collected by Hieronymus in the province of Córdoba; at the same time the collector sent back seeds to Europe, whereby the plant was introduced into cultivation at the Berlin Botanic Garden. It seems probable that its occurrence in this country is due to rubbish thrown out of the Oxford Botanic Garden. According to Urban, *B. insignis* has a wider distribution in South America than *B. Hieronymi*, being recorded from Brazil, Uruguay, the Argentine and Patagonia.

The most obvious character separating *B. Hieronymi* from *B. insignis* is to be seen in the sepals, which in the former species are ovate or broadly ovate and coarsely incise-serrate to pinnatifid, while in the latter species they are linear-subulate, lanceolate or triangular-lanceolate and entire. A second character is in the structure of the valves of the fruit (" *carpidia* " of Urban), which in *B. Hieronymi* are longitudinally open on the ventral side in their lower part, while in *B. insignis* they are closed ventrally. For a fuller account of both these species, reference may be made to Urban's great " *Monographia Loasacearum* " in *Nov. Act. Acad. Caes. Leopold.-Carol. Germ. Nat. Cur.*, *76*, 1900; on pp. 353-5 of that work *B. Hieronymi* is described in great detail, and on pp. 351-3 a comparable account of *B. insignis* will be found; on t. 8, figs. 25-52 dissections of the former species are illustrated and diagrams given.

†249/1. Ammi majus L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.).

†250/1. Carum Carvi L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938 (sp.).

250/4. Carum segetum (L.) Benth. ex Hook. f. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.).

†252/1. Falcaria vulgaris Bernh. 23, Oxon. 6. Still in its Culham locality (see *Fl. Oxfordsh.*, ed. 2, 193) in 1941 (sp.), where it grows in a large patch that is conspicuous even from the passing train.

255/1. Pimpinella major (L.) Huds. 23, Oxon. 6. Lane on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

†261/3. Anthriscus Cerefolium (L.) Hoffm. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.).

†263/1. Foeniculum vulgare Mill. 23, Oxon. 4. Manor Road, Oxford, 1938.

†279/1. Coriandrum sativum L. 23, Oxon. 4. Manor Road, Oxford, 1937. 6. Jackdaw Lane, Oxford, 1939.

†281/1. Bifora radians M. Bieb. 22, Berks. 1. Weed in a field of planted vetches N.W. of Fyfield, 1941 (sp.), N.Y.S. & J.P.M.B.

296/4. Galium saxatile L. 23, Oxon. 6. In two small areas in Coombe Wood near Cuddesdon!, 1944, found by Prof. T. G. B. Osborn.

†298/5. Asperula arvensis L. 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1941 (sp.).

301/1c. Valeriana officinalis L. f. dentatifolia (Druce) Drabble. 22, Berks. 2. Rather dry roadside bank, Tubney Wood, 1942 (sp.), P.G.B. & J.P.M.B.

301/3. Valeriana dioica L. 23, Oxon. 4. On Otmoor near Beckley, 1937-8. 5. Ducklington, 1938.

306/2. Dipsacus pilosus L. 23, Oxon. 4. Manor Road, Oxford, 1938-44 (sp.); probably not native here. It appears to be slowly increasing at present, but is still confined to one very limited area.

†306/3. Dipsacus sativus (L.) Honck. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937.

†306/4. Dipsacus laciniatus L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1940 (sp.).

†318/13. Aster novae-angliae L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1937 (sp.), with both blue-violet and reddish-purple ray florets. The capitula emit a pleasant resinous fragrance when bruised.

328/3. Gnaphalium sylvaticum L. 22, Berks. 2. Cothill, 1938.

†333/1. Inula Helenium L. 22, Berks. 1. In immense profusion over an area of more than 500 square yards, associated with *Ligustrum*, *Rubi*, *Epilobium hirsutum*, etc., in rough, damp ground near the edge of a thicket, and spreading into neighbouring coarse grassland on the S. side of Wytham Hill, 1944 (sp.), Dr E. W. Jones & J.P.M.B. In *B.E.C. 1918 Rep.*, 459, 1919, Druce wrote:—"Wytham, abundant 1899. I was unable to see it in 1918." In view of this statement, it seems desirable to place on record the fact of its continued existence in what is quite likely to be Dr Druce's original locality.

†351/1. Guizotia abyssinica (L.) Cass. 23, Oxon. 4. Manor Road, Oxford, 1938. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.).

†354/1. GALINSOGA PARVIFLORA Cav. 23, Oxon. 4. Manor Road, Oxford, 1938 (sp.). 6. A few plants by a rubbish heap in a field near Iffley Lock, 1944 (sp.), N.E.G.C. & J.P.M.B.

†354/2b. GALINSOGA QUADRIRADIATA Ruiz & Pav. var. HISPIDA (DC.) Thell. 23, Oxon. 7. Shiplake and in Newtown Farm allotments, Henley, 1943, Miss HODGMAN. Specimens from both these localities are in the herbarium of the Department of Botany, Oxford University, and duplicates, for which I am very grateful to Dr Polunin, are in Herb. Brenan. Miss Hodgman informed me that in the Henley allotments referred to the *Galinsoga* was as troublesome a weed as groundsel.

†368/1. ANTHEMIS TINCTORIA L. 23, Oxon. 5. On the embankment of a new bridge near Wolvercote, 1938 and subsequently (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.).

†378/1. ARTEMISIA ABSINTHIUM L. 23, Oxon. 5. Several patches on a bank by a pond in an old gravel pit and by the side of the adjacent main road near Cassington, 1944, R.B. & J.P.M.B. 6. Waste ground, Jackdaw Lane, Oxford, 1940, J.N.M. & J.P.M.B.

†383/10e. SENECIO VULGARIS L. var. RADIATUS Koch. 23, Oxon. 4. Waste ground, Jack Straw's Lane, Oxford, 1942 (sp.), J.N.M. & J.P.M.B.

†385/2. CALENDULA ARVENSIS L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.).

393/1. ARCTIUM LAPPA L. 23, Oxon. 6. Near Stanton Great Wood, 1942, R.B. & J.P.M.B. 7. Waste ground by the waterworks at Lambridge Wood, Henley, 1940 (sp.), J.N.M. & J.P.M.B.

395/2×1. CARDUUS CRISPUS L. × NUTANS L. (×C. NEWBOULDII H. C. Wats.). 23, Oxon. 5. Roadside between Cassington and Wolvercote, 1942 (sp.), R.B. & J.P.M.B.

396/1×2. CIRSIUM ERIOPHORUM (L.) Scop. × VULGARE (Savi) Airy-Shaw. 23, Oxon. 4. With an abundance of the parent species in open, dry, calcareous grassland, Stonepit Hills near Weston-on-the-Green, 1943 (sp.). Previously recorded from North Essex, and probably from Dorset and North Somerset (see J. E. Lousley in *Journ. Bot.*, *72*, 171-3, 1934). I am indebted to Mr Lousley for kindly confirming my determination; he writes (*in litt.*):—" The specimens . . . . are a trifle more on the side of the last named species [i.e. *C. vulgare*] than my own material. But there is no doubt about them and I think they must go under ×*C. Gerhardti*."

†397/1. ONOPORDON ACANTHIUM L. 22, Berks. 2. A few plants by the roadside S.W. of Pusey, 1942, P.G.B. & J.P.M.B. 23, Oxon. 5. Waste ground by a railway bridge near Yarnton, 1941. 6. Waste ground, Jackdaw Lane, Oxford, 1940-42 (sp.), increasing there when last seen; roadside near Littlemore, 1938-44.

402/1. Serratula tinctoria L. 23, Oxon. 6. Field on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

421/3. Hypochaeris glabra L. 22, Berks. 2. Thinly scattered over a dry, sandy, cultivated field close to the fen at Cothill, in company with *Silene anglica* and *Filago spathulata*, 1944 (sp.), A. P. D. Jones & J.P.M.B.

423/15. Taraxacum palustre (Lyons) DC., *sens. lat.* 23, Oxon. 5. Wet field by the toll bridge, Eynsham, 1937 (sp.).

†425/2c. Lactuca Serriola L. var. dubia (Jord.) Rouy. 22, Berks. 2. Plentiful on waste ground between Kennington and South Hinksey, 1943 (sp.), R.B. & J.P.M.B. I suspect that this will prove to be the prevalent lettuce on waste ground in and around the city of Oxford.

427/2b. Sonchus arvensis L. var. glabrescens Günth., Grab. & Wimm., *Enum. Stirp. Phan. . . . in Silesia . . .*, 127, 1824; Bluff & Fingerh., *Comp. Fl. Germ.*, *2*, 259, 1825. *S. arvensis* var. *laevipes* Koch, *Syn. Fl. Germ. Helv.*, ed. 2, *2*, 498, 1844. 22, Berks. 1. Several plants of this variety (no typical *S. arvensis* seen) among sedges in marshy ground on Oxford Clay near a pond above Nealing's Copse on the S. side of Wytham Hill, 1944 (sp.), Dr E. W. Jones & J.P.M.B.

The epithet *glabrescens* appears to be the earliest for this variety; it clearly antedates *laevipes*, under which name this plant has been discussed recently. I am unable to explain "b. *laevis* (G.G.W.)," which is the nomenclature adopted by Druce in the *British Plant List*, ed. 2, 1928, unless *laevis* is an error for *glabrescens*; it may be noted that Druce used the latter epithet in the second edition of *Fl. Oxon.* published a year previously. As Günther, Grabowski and Wimmer's work appears to be uncommon, a transcription of the original description may be useful:—"*Sonchus arvensis* L. . . . . β glabrescens nob. pedunculis calycibusque glabris. Bei Reinerz (Wiemann). Bei Einsiedel im Gesenke. Aug. ♃." I am indebted to Miss G. Guiney and to the library of the Botany School, Cambridge University for enabling me to consult this work.

In view of the interesting note on this plant by J. E. Lousley in *B.E.C. 1941-42 Rep.*, 471, 1944, it may be added that the habitat on Wytham Hill must be very similar to that at Epsom. As is described for Mr Lousley's plant, the peduncles and involucres of the Wytham plant are quite glabrous.

427/3c. Sonchus asper (L.) Hill var. pungens Bisch. 23, Oxon. 6. Cultivated ground near a house in Coombe Wood, Cuddesdon, 1944 (sp.).

427/3d. Sonchus asper (L.) Hill var. glandulosus (Coss. & Germ.) Druce. 23, Oxon. 5. Cultivated field W.S.W. of Cassington, 1942 (sp.), R.B. & J.P.M.B.

†428/1. Tragopogon porrifolius L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937-40 (sp.). The ground on which it grew has been since much disturbed and the plant is now no longer there.

†435/4. Campanula rapunculoides L. 22, Berks. 2. Established on a hedge-bank and in a neighbouring field at Pusey, 1942 (sp.), P.G.B. & J.P.M.B.

460/2. Primula vulgaris Huds. 23, Oxon. 5. With flowers white except for a yellow " eye " at E. end of Wychwood, 1938 (sp.).

467/2. Anagallis arvensis L. subsp. phoenicea (Scop.) Schinz & Keller. 23, Oxon. 6. Cultivated allotment ground, Headington, 1941 (sp.). One plant with numerous branches from the base, some branches with leaves all opposite and paired at the nodes, others with paired leaves and flowers at the lower nodes and ternate leaves and flowers at the upper nodes. I have this year (1944) observed in the neighbourhood of Oxford plants of *Epilobium montanum* L. and *E. hirsutum* L. showing a similar diversity of phyllotaxis on one and the same plant. These occurrences suggest that varieties in these genera based on the character of the leaves being ternate instead of paired (*Anagallis arvensis* L. var. *verticillata* Diard, *Epilobium montanum* L. var. *verticillatum* Koch) are of little systematic importance

†497/1×4. Symphytum officinale L. × peregrinum Ledeb. 22, Berks. 1. Roadside N.N.W. of Cumnor, 1939 (sp.). 23, Oxon. 6. Roadside near Holton, 1938 (sp.), N.E.G.C. & J.P.M.B.

501/1. Lycopsis arvensis L. 23, Oxon. 6. By the road between Nuneham Courtenay and Dorchester, 1938.

†506/7. Myosotis sylvatica (Ehrh.) Hoffm. 23, Oxon. 6. This species was recorded from Nuneham Courtenay by the writer (*B.E.C. 1937 Rep.*, 491, 1938), but it should be added it is almost certainly not native in this locality, there being numerous other obviously introduced plants in woodland near by. I visited the locality again in 1938 in company with Mr Burn and we noticed the white-flowered form (var. *lactea* Boenn.) there as well as normal blue-flowered plants.

†512/1. Ipomoea purpurea (L.) Lam. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1941 (sp.).

†517/15. Solanum Capsicastrum Link. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.). The bushy pot-plant bearing large, handsome, orange-scarlet, round fruits that is so familiar in florists' and greengrocers' shops about Christmastide seems to belong to this species; its occurrence on tips would thus be easily explained. The inflorescences of the pot-plants seem always to be cut off, perhaps to increase the bulk of those fruits selected to mature, and thus the fact that it is a congener of our familiar nightshades is not immediately apparent.

†518/1. Physalis Alkekengi L. 23, Oxon. 4. Two large patches by the roadside S.S.W. of Gosford Bridge near Kidlington, 1944 (sp.), C. E. Hubbard & J.P.M.B.

†518/7. Physalis peruviana L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 (sp.).

†521/1. Atropa Belladonna L. 23, Oxon. 4. One large plant among bushes by the bank of a backwater of the R. Cherwell, Manor Road, Oxford, 1938-44. Doubtless not native here.

†522/1. Datura Stramonium L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1941-44. 6. Waste ground, Jackdaw Lane, Oxford, 1938.

Var. Tatula (L.) Torr. (var. *chalybea* Koch). 23, Oxon. 4. One plant on waste ground by roadside, South Parks Road, Oxford, 1940 (sp.); masonry was heaped on top of the plant shortly afterwards, and it has not reappeared. I must thank Mr A. J. Wilmott for kindly confirming the nomenclature of this variety, and also Miss R. Guiney for her assistance.

524/1. Hyoscyamus niger L. 22, Berks. 1. Numerous dead fruiting stems left standing from previous season on S.W. side of Long Copse on Cumnor Hill, April 1944, R.B. & J.P.M.B. 23, Oxon. 6. Jackdaw Lane, Oxford, 1938-41.

†Var. pallidus Waldst. & Kit. 23, Oxon. 5. Waste ground, Port Meadow, Oxford. 1941 (sp.), N.Y.S. & J.P.M.B.

†527/5. Verbascum Blattaria L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938 (sp.).

†532/2. Linaria purpurea Mill. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938. 6. Waste ground, Jackdaw Lane, Oxford, 1942, J.N.M. & J.P.M.B.

532/25. Linaria Elatine (L.) Mill. 22, Berks. 2. In a sandy cultivated field near the fen at Cothill, 1944, A. P. D. Jones & J.P.M.B.

†534/2. Antirrhinum Orontium L. 23, Oxon. 4. Numerous plants on waste ground, Manor Road, Oxford, 1937-8 (sp.).

†543/41. Veronica filiformis Sm. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.). 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.).

†558/3. Mentha longifolia (L.) Huds. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1942 (sp.), J.N.M. & J.P.M.B., det. A. L. Still.

†558/3b. ×Mentha niliaca Jacq. var. nemorosa (Willd.). 22, Berks. 1. By the towpath at King's Weir between Wolvercote and Cassington, 1944 (sp.)., N.E.G.C. & J.P.M.B.

†558/12. ×Mentha rubra Huds. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.), J. F. G. Chapple & J.P.M.B., conf. A. L. Still, who, however, writes:—" I suppose so, on

the long calyces, but not at all typical. Unusually hairy on calyces and apparently, in some cases, on pedicels. The 'bracts' are also not typical."

†565/1. Melissa officinalis L. 23, Oxon. 5. One plant on the canal bank between Oxford railway station and Wolvercote, 1944 (sp. in Herb. A.P.D. Jones, Aldenham), A. P. D. Jones & J.P.M.B.

†566/6. Salvia Sclarea L. 22, Berks. 2. Waste ground near Kennington, 1941 (sp.).

†579/1. Leonurus Cardiaca L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1938 and subsequently (sp.), plentiful in one small area.

†581/2. Lamium maculatum L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.).

†588/1. Plantago indica L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.).

†596/3. Amaranthus hypochondriacus L. (*A. hybridus* L. subsp. *hypochondriacus* (L.) Thell.). 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1940 (sp.). An extremely handsome and striking amaranth, in habit closely resembling *A. chlorostachys* Willd., with a densely compound purple inflorescence.

†596/4. Amaranthus chlorostachys Willd., *sens. lat.* 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.). The plant is immature and hence a more precise determination is impossible.

†600/3. Chenopodium Bonus-Henricus L. 22, Berks. 2. Abingdon, 1937 (sp.). 23, Oxon. 4. Beckley, 1937 and subsequently. 5. On roadside, North Leigh Heath, 1944, A. P. D. Jones & J.P.M.B.

†600/4. Chenopodium hybridum L. 22, Berks. 2. Has occurred sporadically for a few years on some waste ground by the roadside about half a mile S.S.E. of Cumnor.

†600/6. Chenopodium murale L. 23, Oxon. 5. Appeared again at Port Meadow in 1940 (sp.), N.E.G.C. & J.P.M.B. Its last recorded occurrence there seems to have been in 1889 (*Fl. Oxfordsh.*, ed. 2, 356).

†600/7. Chenopodium opulifolium Schrad. 23, Oxon. 4. Waste ground, Jack Straw's Lane, Oxford, 1938 and subsequently (sp.). 5. Waste ground, Port Meadow, Oxford, 1944, A. P. D. Jones & J.P.M.B.; plentiful on waste ground, Binsey Lane, 1938 (sp.). 6. Abundant on waste ground near Bullingdon Green, 1939 and subsequently (sp.).

†600/8k. Chenopodium viride L. 23, Oxon. 4. Waste ground, Jack Straw's Lane, Oxford, 1941 (sp.), J.N.M. & J.P.M.B. 5. Waste ground, Port Meadow, Oxford, 1944 (sp.), A. P. D. Jones & J.P.M.B.

†600/8u. CHENOPODIUM PSEUDOSTRIATUM Zschacke. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938 (sp.), det. Dr P. AELLEN, who writes:—" It is an alien plant, prob. not of hybrid character." The Oxford plants were robust, 7-8 dm. high, with broad leaves, and often much suffused with deep red-purple. It was in flower in the third week of October, and had scarcely set any seed by the 20th November, when the plants were killed by frost.

†600/8(2). CHENOPODIUM RETICULATUM Aell. 23, Oxon. 5. I had the privilege of examining some *Chenopodia* from the herbarium of Mr P. G. Beak, and among them was a specimen of the above species collected in September 1934 in a cornfield at Bampton by P. G. Beak (no. 719). A hybrid with *C. album* L. was recorded from Oxford by Mr J. F. G. Chapple and the writer (*B.E.C. 1938 Rep.*, 54, 1939); but this is the first record of the species itself from the county, and is of interest in being from a habitat well away from any centre for alien introductions. The recent discovery and the paucity of records of this species from Britain are doubtless due in large part to the extreme difficulty of separating it from *C. album* in the field. I think it likely that its status in Europe will be found to be similar to that of *C. album*, and indeed it is possible that *C. reticulatum* would be more satisfactorily placed as a subspecies under it; however, the sculpturing of the testa—a character of high importance in this genus—is widely different in the two.

†600/11b. CHENOPODIUM PRATERICOLA Rydb. var. THELLUNGIANUM Aell. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1936 (sp.). 5. Waste ground, Port Meadow, Oxford, 1940 (sp.).

†600/12. CHENOPODUM FICIFOLIUM Sm. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1939 (sp.).

†600/14. CHENOPODIUM VULVARIA L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937 (sp.).

†600/15. CHENOPODIUM POLYSPERMUM L. 23, Oxon. 4. Abundant on waste ground, Manor Road, Oxford, 1938.

†604/1. BETA TRIGYNA Waldst. & Kit. 23. Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1940 (sp.).

615/10×7. POLYGONUM MITE Schrank × PERSICARIA L. 22, Berks. 1. Wet, muddy place in a meadow at Hagley Pool between Wolvercote and Eynsham, 1941 (sp.), N.Y.S. & J.P.M.B.

†615/19. POLYGONUM PATULUM M. Bieb. (*P. Bellardi* auct.). 22, Berks. 2. In a potato patch near North Hinksey, 1942 (sp. in Herb. P. G. Beak), P.G.B. & J.P.M.B. 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1940 (sp.), N.E.G.C. & J.P.M.B. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.).

618/3×6a. Rumex crispus L. × obtusifolius L. subsp. agrestis (Fries) Danser. 22, Berks. 1. One large plant by the R. Thames between Swinford Bridge near Eynsham and King's Weir, 1943 (sp.). 23, Oxon. 4. Manor Road, Oxford, 1939 (sp.). 5. Binsey Green, 1940 (sp.). Specimens from all three localities have been confirmed by J. E. Lousley.

618/3×8. Rumex crispus L. × sanguineus L. var. viridis Sibth. 22, Berks. 1. A few solitary scattered intermediates among a profusion of *R. sanguineus* var. *viridis* and frequent scattered *R. crispus* in a rough meadow and marshland by the R. Thames between Swinford Bridge near Eynsham and King's Weir, 1943 (sp.), confirmed by J. E. Lousley.

623/1. Daphne Laureola L. 23, Oxon. 6. Mongewell, 1938, N.E.G.C. & J.P.M.B.

†628/11. Euphorbia Cyparissias L. 23, Oxon. 4. A large patch in a sandy field below Stow Wood, shown to me by N.E.G.C. in 1938 (sp.). I fear that this has now been exterminated through ploughing

†628/16. Euphorbia Lathyris L. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1937-8 (sp.).

†635/1. Cannabis sativa L. 23, Oxon. 4. Jack Straw's Lane, Oxford, 1938 (sp.).

†646/3. Quercus Cerris L. 22, Berks. 2. Two large trees in a wood by the R. Thames between Radley and Abingdon, 1941-2 (sp.).

650/5. Salix purpurea L. 22, Berks. 2. ♀ tree at Cothill, 1938 (sp.), N.E.G.C. & J.P.M.B. 23, Oxon. 4. ♂ tree on hillside above Headington Wick copse, 1938 (sp.), N.E.G.C. & J.P.M.B.

650/11. Salix repens L. ♀. 23, Oxon. 4. Otmoor, one plant, 1937 (sp.), N.Y.S. & J.P.M.B.

669/7. Orchis latifolia L. sec. Pugsley. 23, Oxon. 4. In a damp meadow on the E. side of the R. Cherwell N. of the Parks, Oxford, 1937 (sp.), J. F. G. Chapple & J.P.M.B.

669/10. Orchis ericetorum (Linton) E. S. Marshall. 23, Oxon. 4. Damp enclosure on Otmoor N.N.W. of Beckley, 1937 (sp.).

669/14. Orchis mascula L. I have observed plants with unspotted leaves in Bagley Wood, Berks. (district 2), in 1938, and, in company with Prof. T. G. B. Osborn and Dr A. R. Clapham, in a wood overhanging the R. Evenlode N.W. of East End, Oxon. (district 5), in 1944. In the last-named locality they were connected with the normal by plants with leaves of numerous intermediate degrees of spottiness.

707/2. Ornithogalum umbellatum L., *sens. lat.* 23, Oxon. 5. A patch among scrub at Ranger's Lawn E. of Charlbury, 1938 (sp.). This specimen does not agree with the detailed descriptions of either *O. umbellatum* L. emend. Bor. or *O. angustifolium* Bor. given by C. E. Britton (*B.E.C. 1941-2 Rep.*, 588-9, 1944), the perianth segments being only about 1.5-1.8 cm. long; the specimen shows both 3- and 5-flowered inflorescences.

719/2×3(=2b). LUZULA FOSTERI (Sm.) DC. × PILOSA (L.) Willd. (× L. BORRERI Bromf.). 23, Oxon. 7. Lambridge Wood near Henley, 1940, R.B. & J.P.M.B.

727/4. LEMNA GIBBA L. 23, Oxon. 4. Very abundant in the Rivers Ray and Cherwell near their junction close to Islip and flowering rather freely in the latter river, 18th August 1944 (sp.), C. E. HUBBARD & J.P.M.B.

729/1b. ALISMA LANCEOLATUM With. 22, Berks. 1. In fair quantity in a marsh by the R. Thames between Swinford Bridge and Hagley Pool, 1943 (sp.).

753/4. CAREX VESICARIA L. 22, Berks. 1. By a backwater of the river, Hagley Pool near Wytham, 1939-40 (sp.).

753/9d. CAREX HIRTA L. var. SPINOSA Mort. 22, Berks. 2. Damp path near the fen, Cothill, 1939 (sp.); bank of R. Thames near Oxford, 1936 (sp.). In the Cothill plant the glumes are up to 17 mm. long; in that from Thames-side the ♀ spikelets are compound at the base.

753/12. CAREX STRIGOSA Huds. 22, Berks. 4. Plentiful in a damp stream valley near Padworth, 1942 (sp.).

753/19. CAREX HOSTIANA DC. 23, Oxon. 4. Plentiful in some damp enclosures on the S. side of Otmoor, 1937 (sp.). 6. Meadow on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

753/19×21. CAREX HOSTIANA DC. × LEPIDOCARPA Tausch. 23, Oxon. 4. Bog under Stow Wood, 1937 (sp.), confirmed by E. NELMES.

753/31. CAREX TOMENTOSA L. This was recorded from Otmoor by the writer in *B.E.C. 1937 Rep.*, 514, 1938. It may be of interest to add that it grows in abundance over a large part of two enclosures; its habitat here—wet, alluvial pastures—is in striking contrast to its only other locality in the county, near Westwell, where it occurs in rough, dry, upland, oolitic grassland, and where it is unfortunately in small quantity. I have seen much of one of the Otmoor enclosures under several inches of water after a summer thunderstorm the previous evening. A plant from Otmoor is now growing in the Oxford Botanic Garden.

753/32. CAREX PILULIFERA L. 23, Oxon. 4. Headington Wick, 1940, Dr F. B. HORA & J.P.M.B. 7. Lambridge Wood near Henley, 1940, R.B. & J.P.M.B.

753/34. CAREX PALLESCENS L. 23, Oxon. 4. Sparingly by a damp, shady path in Pennywell Wood near Elsfield, 1944 (sp.). 6. Plentiful and robust in damp rides on Oxford Clay in Waterperry Wood, 1942 (sp.).

753/36. CAREX PANICEA L. 23, Oxon. 4. By the canal between Upper and Lower Heyford, 1937 (sp.); near Woodeaton. 5. Near Ducklington, 1938; wet, alluvial meadow near Wolvercote, 1937 (sp.).

f. TUMIDULA Laest. 22, Berks. 1. Wet, alluvial meadow, Hagley Pool near Wytham, 1940 (sp.).

753/53. CAREX LEPORINA L. 23, Oxon. 4. One patch on Otmoor near Beckley, 1937; in one place in a rough, dry meadow at the E. end of Prattle Wood near Noke, 1944 (sp.). 6. Stanton Great Wood, 1942, R.B. & J.P.M.B.

753/57×59. CAREX OTRUBAE Podp. × REMOTA L. (×C. AXILLARIS Good.). 23, Oxon. 4. One large tuft of the hybrid growing with the parent species by a damp path in Little Wood near Elsfield, 1944 (sp.). 5. Two tufts of the hybrid amid a profusion of the parent species in a damp ride in Burleigh Wood near Bladon, 1942 (sp.), R.B. & J.P.M.B. A duplicate of the last collection has been sent to Mr E. Nelmes, of Kew. It is apparently a scarce plant in Oxfordshire, for which Druce (*Fl. Oxfordsh.*, ed. 2, 465) gives but five localities.

753/66. CAREX DISTICHA Huds. 23, Oxon. 5. Alluvial meadow near Ducklington, 1938.

753/74. CAREX PULICARIS L. 23, Oxon. 4. Damp enclosure on the S. side of Otmoor, 1937 (sp.).

†754/8. ECHINOCHLOA CRUS-GALLI (L.) Beauv. 23, Oxon. 4. Waste ground, Manor Road, Oxford, 1938 (sp.).

†756/4. SETARIA VERTICILLATA (L.) Beauv. 23, Oxon. 5. Waste ground, Port Meadow, Oxford, 1938 (sp.).

775/1. MILIUM EFFUSUM L. 23, Oxon. 6. Coombe Wood near Cuddesdon, 1944. 7. Lambridge Wood near Henley, 1940, R.B. & J.P.M.B.

777/1g. PHLEUM NODOSUM L. 23, Oxon. 4. In profusion in rough, open, dry, calcareous grassland, Stonepit Hills near Weston-on-the-Green, 1943 (sp.). 7. Field near Lambridge Wood, Henley, 1940, R.B. & J.P.M.B.

†794/6d. AVENA STRIGOSA Schreb. var. ORCADENSIS (Marq.) Druce. 22, Berks. 2. A single plant in a cultivated field by the footpath from Chilswell Farm to South Hinksey, 1944 (sp.). N.Y.S. & J.P.M.B.

795/1b. ARRHENATHERUM ELATIUS (L.) J. & C. Presl f. BIARISTATUM (Peterm.) Bertram. 23, Oxon. 4. Roadside near Marston, on the way to Elsfield, 1944 (sp.), R.B. & J.P.M.B. I am indebted to Mr C. E. Hubbard for informing me of the author for the epithet *biaristatum* in formal rank.

800/1. SIEGLINGIA DECUMBENS (L.) Bernh. 23, Oxon. 6. Field on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

813/1. MOLINIA CAERULEA (L.) Moench. 23, Oxon. 4. Pasture on Otmoor, 1943, Dr A. R. CLAPHAM & J.P.M.B. 6. Sparingly in a field on the N.E. side of Stanton Great Wood, 1942, R.B. & J.P.M.B.

814/1. CATABROSA AQUATICA (L.) Beauv. 23, Oxon. 4. Plentiful in a marsh in a rough, open, steeply sloping pasture above Noke Wood near Beckley, 1944 (sp.), R.B. & J.P.M.B.

825/2×3. GLYCERIA FLUITANS (L.) R. Br. × PLICATA Fries. (×G. PEDICELLATA Towns.). 23, Oxon. 5. Ditch by Port Meadow, Oxford, 1941 (sp.), J.N.M. & J.P.M.B., confirmed by C. E. HUBBARD.

825/3(2). GLYCERIA DECLINATA Bréb. 22, Berks. 2. Muddy margin of stream, Boar's Hill, 1941 (sp.), P.G.B. & J.P.M.B., confirmed by C. E. Hubbard. The record from between Oxford and Eynsham, in *B.E.C. 1939-40 Rep.*, 304, 1942, is an error and must be deleted; the plants found were merely depauperate specimens of *G. plicata* Fries.

†827/4. BROMUS TECTORUM L. 23, Oxon. 6. Waste ground, Jackdaw Lane, Oxford, 1939 (sp.).

827/19(2). BROMUS LEPIDUS Holmberg. 22, Berks. 2. Pasture at the foot of White Horse Hill, 1938 (sp.); waste ground at the top of Cumnor Hill, 1939 (sp.); roadside near the top of Hinksey Hill, 1938 (sp.). 5. Shinfield Road, Reading, 1941 (sp.), Dr F. B. HORA & J.P.M.B.; plentiful on the roadside at Loddon Bridge near Maiden Erleigh, 1941 (sp.), Dr F. B. HORA & J.P.M.B. 23, Oxon. 4. By the by-pass road near Old Marston, 1939 and subsequently (sp.); roadside between Headington and Stow Wood, 1937 (sp.). 5. Roadside at Burford, 1938 (sp.); between Stanton Harcourt and South Leigh, 1943, R.B. & J.P.M.B. 6. Roadside near Benson, 1938 (sp.).

828/2. BRACHYPODIUM PINNATUM (L.) Beauv. 23, Oxon. 7. Field near Lambridge Wood, Henley, 1940, R.B. & J.P.M.B.. Curiously, this species has no records from this district in Druce's *Fl. Oxfordsh.*, ed. 2, 499.

830/6. AGROPYRON CANINUM (L.) Beauv. 22, Berks. 2. Roadside between Radley and Kennington, 1943 (sp.), R.B. & J.P.M.B. The inflorescences were intensely glaucous, and Mr C. E. Hubbard, to whom a duplicate has been given, says that it is intermediate between var. *glaucum* (Hack.) and var. *glaucescens* (Lange).

834/1. NARDUS STRICTA L. 23, Oxon. 4. A clump on a dry hillside near Headington Wick, 1938, N.E.G.C. & J.P.M.B. This is, however, not the first evidence for its occurrence there, for there is a specimen preserved in the ecological herbarium of the Department of Botany, Oxford University, from "heathy ground on calcareous grit," Headington Wick, collected on 2nd June 1921, by H. Baker.

836/3. ELYMUS EUROPAEUS L. 23, Oxon. 6 or 7? Wood above Chinnor, 1938 (sp.). 7. Lambridge Wood near Henley, 1940 (sp.), R.B. & J.P.M.B.

851/2. ASPLENIUM TRICHOMANES L. 23, Oxon. 5. Bridge over the R. Evenlode S.W. of Bladon, 1942, R.B. & J.P.M.B.

851/7. ASPLENIUM RUTA-MURARIA L. 23, Oxon. 5. Bridge over the R. Evenlode S.W. of Bladon, 1942, R.B. & J.P.M.B.

856/7. DRYOPTERIS OREOPTERIS (Ehrh.) Maxon. 23, Oxon. 3. In the E. part of Worton Wood N.E. of Sandford St Martin, 1944 (sp. in Herb. Brenan), Dr E. W. JONES. A new and welcome record for this fern, which Druce (*Fl. Oxfordsh.*) describes as " very rare and probably extinct " in the county. I have placed the locality in district 3, as Druce appears to have done so consistently, so far as I have seen, in the flora ; but according to his definitions of the boundaries of the botanical districts in the introduction, it should apparently be in district 5. The lack of a map of the district boundaries in the flora is troublesome.

859/1. CETERACH OFFICINARUM DC. 23, Oxon. 5. Bridge over the R. Evenlode S.W. of Bladon, with 851/2 and 851/7, 1942, R.B. & J.P.M.B.

873/1. TOLYPELLA INTRICATA (Roth) Leonh. 23, Oxon. 4. Found by R.B. and the writer on 17th January 1943, growing in fair quantity with a sterile *Chara* (probably *C. vulgaris* L.) in water a few inches deep in a small, muddy ditch about half a mile S. of Wood Eaton by the road to Marston : an apparently unpromising time of year and locality for charophytes ! The plants were heavily encrusted and extremely brittle. The writer collected specimens the following spring, but by 1944 the ditch was grown over and the charophytes had disappeared. Thus this " vegetable comet " has once again come and gone in its accustomed fashion.

876/3b. CHARA VULGARIS L. var. LONGIBRACTEATA (Coss. & Germ.) Kuetz. 23, Oxon. 5. Plentiful in a small pond in a gravel pit between Sutton and South Leigh, 1943 (sp.), R.B. & J.P.M.B.

ADDITIONS AND EMENDATIONS TO THE COMITAL FLORA FOR V.C. 30 (BEDFORDSHIRE).

JOHN G. DONY, Ph.D.

As its title suggests, this is not intended to be a survey of the present state of the botanical knowedge of Bedfordshire, but a criticism of the records listed for the vice-county in the *Comital Flora.*

The county was fortunate in having an early written flora in Abbot's *Flora Bedfordiensis* (1798). In addition, Charles Abbot (1761-1817) made a list of further records in his own interleaved copy (2) now in the possession of Mr R. L. Hine of Hitchin. He also made a herbarium now on long loan to Luton Public Museum, but failed to give localities for his specimens. R. A. Pryor made a study of this herbarium (5) which is useful only as a check on Abbot's knowledge; but not upon his records. The next lists of Bedfordshire plants are to be found in the *Transactions of the Bedfordshire Natural History Society,* which was very active from 1875 to 1885. These include two lists by William Hillhouse (3) and (4) and two for which James Saunders (1839-1925) was mainly or wholly responsible (6) and (8). Most of Saunders' records in these lists were duplicated in a similar list in the *Journal of Botany* in 1883 (7). A herbarium made by the Society is still at Bedford; but is now, owing to bad attacks by insects, in a condition which makes it almost useless.

Saunders gave considerable study to the flowering plants from 1878 to about 1886; but later became more interested in cryptogams. His *Field Flowers of Bedfordshire,* 1911, was most incomplete and contained only a part of what he himself knew of the flora of the county.

In the meantime two botanists, William Crouch (1818-1846) and John McLaren (1815-1888), had made useful herbaria which were well annotated and are still in good condition.

John Hamson (1858-1930) in 1906 produced a small *Account of the Flora of Bedfordshire* (10) but did more useful work in compiling a list of records (13). The main fault with Hamson's work was that he kept no specimens and tended to rely upon his own identification of somewhat critical plants. The article on Botany in the *Victoria County History of Bedfordshire* (9) was well-written and was the first attempt to divide the records among sub-divisions based on river drainage. Seven such divisions were made, but the work lacked thoroughness as only one plant was recorded from one district while from another no plants at all were listed.

In recent years the county has been fortunate in the thorough study which J. E. Little (1861-1935) gave to one district. His papers on the Ivel District in the *Journal of Botany* in 1919 (12) and in this Society's *Report for 1935* (15) were the first attempts at a systematic study of botany in the county. The last-named paper was finished by Miss K. D.

Little after her father's death and is consequently less complete than he would have made it.

In 1936 the author, in collaboration with Dr V. H. Chambers, began a close study of the flora of the county, using a revision of the drainage areas. A preliminary survey of literature has been made, specimens collected widely and a study made of herbaria relating to the county. We have had much assistance from local and other botanists as the following notes indicate, but they are too numerous to list in detail. Our thanks are nevertheless due to them. Mr E. Milne-Redhead, fortunately for us stationed at Dunstable during the whole of the 1944 season, has been especially helpful.

The list which follows has presented some difficulties. The chief of these has been determining which of the early recorded species may now be considered to be extinct. The fact that no record has been made since Abbot may only mean that the plant has been overlooked, as we have found in the case of *Trifolium medium*, *Veronica montana* and *Elymus europeus*. The principle adopted has been to consider as now extinct the more conspicuous plants, and also those recorded from localities now under cultivation and from marshes long since drained, as the few remaining marshes have been well searched during the last sixty years.

In addition there are in the *Comital Flora* a few records for the county for which we can find no evidence: *Mentha rubra*, *Chenopodium opulifolium*, *C. Vulvaria*, *Allium oleraceum*, *Eleocharis acicularis*, *Eriophorum* (" *paniculatum* "), *Festuca ambigua* and *Bromus interruptus*. There are no specimens of any of these plants from Bedfordshire in Herb. Druce and it would be interesting to know upon what authority they are included in the *Comital Flora*.

There is some confusion as to the use of brackets in the *Comital Flora*, the explanation on page ix not agreeing with the practice adopted in the text. A record in brackets is stated to mean that the plant while native elsewhere is not so in the vice-county to which the record refers. This is most obviously its use in most cases in the text, e.g. 1/1, 4/1, 6/6, 9/1, 9/2, etc., which refer to species with which there can be little doubt of identity. But for many alien species, e.g. 54/20, 127/5, 754/10 and 11, brackets are omitted in the *Comital Flora*, and for these species I have therefore followed the usage of the book. It is most desirable that a ruling should be made on this and similar questions.

ABBREVIATIONS USED IN THE TEXT.

*	A vice-county record to be added to *C.F.*
†	Not native in the county.
e	Presumed now extinct.
[C.]	A specimen in Herb. Crouch, made by William Crouch between 1841 and 1845. Now at Luton Public Museum.
[M.1]	A specimen in Herb. McLaren, made by James McLaren between 1845 and 1886. Now at British Museum (Natural History).

[M.2]	A specimen in Herb. McLaren entered for the Royal Horticultural Society's Competition, 1864, now at Luton Public Museum.
[S.]	A specimen in Herb. Saunders, made by James Saunders between 1878 and 1925. Now at Luton Public Museum.
[L.]	A specimen in Herb. Luton Museum, begun by the author in 1936, but containing a number of specimens collected by James Saunders and Charles Crouch (1855-1944).
[B.]	A specimen in Herb. British Museum.
[K.]	A specimen in Herb. Kew.
v.-c. 20 [Beds.]	A locality in v.-c. 20 [Hertfordshire] but now in the administrative county of Bedfordshire. Similar abbreviations are used in other cases where the Watsonian vice-county does not coincide with the administrative county.
J.McL.	John McLaren.
J.S.	James Saunders.
J.E.L.	J. E. Little.
C.C.	Charles Crouch.
V.H.C.	V. H. Chambers.
E.M.-R.	E. Milne-Redhead.
J.G.D.	John G. Dony.

REFERENCES.

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(2) Notes made by Abbot in his own interleaved copy of *Flora Bedfordiensis.* 1798-1817.

(3) Hillhouse, William. Bedfordshire Plant List for 1875. *Transactions of the Bedfordshire Natural History Society.* 1877.

(4) Hillhouse, William. Bedfordshire Plant List for 1876. *Transactions of the Bedfordshire Natural History Society.* 1878.

(5) Pryor, R. A. Notes on the Herbarium of Abbot. *Journal of Botany*, ***23***, 1881, pp. 40-46; 67-73.

(6) Saunders, James, and Ransom, A. Bedfordshire Plant List for 1882. *Transactions of the Bedfordshire Natural History Society.* 1882.

(7) Saunders, James. On the Flora of South Bedfordshire. *Journal of Botany*, *25*, 1883, pp. 71-75; 175-8; 310-12; 328-32.

(8) Saunders, James. On the Wild Flowers of South Bedfordshire. *Transactions of the Bedfordshire Natural History Society.* 1885.

(9) Hamson, John, Druce, G. C., Saunders, James, and Holmes, E. M. *Victoria County History of Bedfordshire, Botany.* 1904.

(10) Hamson, John. *An Account of the Flora of Bedfordshire.* 1906.

(11) Saunders, James. *The Field Flowers of Bedfordshire.* 1911.

(12) Little, J. E. Notes on Bedfordshire Plants. *Journal of Botany*, 57, 1919, pp. 306-312.

(13) Hamson, John. Records of Bedfordshire Plants. Five volumes of manuscript notes, now in the Library of the Bedfordshire Natural History and Archaeological Society. 1886-1930.

(14) Little, J. E. Notes in interleaved copy of *Field Flowers of Bedfordshire.* 1911-1935.

(15) Little, J. E. The Ivel District of Bedfordshire. *B.E.C. 1935 Report*, 1936, pp. 50-67.

(16) Bishop, E. B. The Roses of Bedfordshire. *B.E.C. 1938 Report*, 1939, pp. 84-92.

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†4/1. ADONIS ANNUA L. "Mrs Abbot has often brought this elegant plant in from the cornfields, and it would have been inserted in the body of the work, but from the general suspicion of its being not indigenous" (2). Pegsdon; 1930 (15): still at Pegsdon. 1944. [L.]. Add in brackets to *C.F.*

*6/22(2). RANUNCULUS RADIANS Revel. Long Lane, Toddington; V.H.C., 1940: Wootton; J.G.D., 1942: both det. R. W. Butcher. Saunders' herbarium contains a specimen named "*Ranunculus ? trichophyllus*, small form, Charlton; 1882," which is probably this. [L.].

6/28. RANUNCULUS BAUDOTII Godr. The inclusion of this in the *Comital Flora* is probably based on Saunders' earlier records from Sundon (7) and (8). Probably on the same authority it was included in *Supplement to Top. Bot.*, 1905. It is unlikely that it would appear in an inland county and as Saunders did not include it in *The Field Flowers of Bedfordshire* and there is no specimen in his herbarium, it is very doubtful if it appeared in the county. Delete from *C.F.*

†13/3. DELPHINIUM GAYANUM Wilmott (D. AJACIS auct. non L.). Fields near Harlington; Mr Anstee, *J. Bot.*, 1889, p. 210 (11): Rubbish dump, Sundon; J.G.D., 1941. There are many other "old" records for "*D. Consolida.*" [S.L.]. Add to *C.F.*

34/1. CHEIRANTHUS CHEIRI L. The only known record is Abbot (1): "Rare. Walls of Bedford Castle." Add "e" to *C.F.* record and remove to brackets.

36/5. BARBAREA INTERMEDIA Boreau. Flitwick; H. Phillips, *B.E.C. 1928 Rep.*, p. 724: Pegsdon; 1931 (14): Leagrave; J.G.D., 1939, det. as probably this, A. B. Jackson. [L.]. Add to *C.F.*

*†54/20. BRASSICA GALLICA (Willd.) Druce. Henlow; E.M.-R. and J.G.D., 1944. [L.]. [Cardington Mill; J.McL., 1885, [S.], is not this species.] No specimen in either of McLaren's herbaria.

*†55/1. DIPLOTAXIS TENUIFOLIA (L.) DC. Waste ground, Luton; J.G.D., 1941. [L.].

88/14. VIOLA CONTEMPTA Jord. Barton; Clifton; Leagrave; coll. H. Phillips; H. Drabble, 1937: *B.E.C. 1936 Rep.*, p. 321: Maiden Bower, Houghton Regis; J.G.D., 1936, det. H. Drabble, "probably young plant." [L.]. Add to *C.F.*

88/17. VIOLA MONTICOLA Jord. Arlesey; H. Phillips; East Tingley Wood, Shillington; J.E.L.; H. Drabble, 1937: *B.E.C. 1936 Rep.*, p. 321. Add to *C.F.*

*88/27. VIOLA ANGLICA Drabble. Maiden Bower, Houghton Regis; J.G.D., 1936, det. H. Drabble. [L.].

88/28b. VIOLA DESEGLISEI Jord. var. SUBTILIS (Jord.). Woburn; G. C. Druce (9): Flitwick; J.G.D., 1936, det. H. Drabble. [L.]. Add to *C.F.*

*88/29. VIOLA ARVATICA Jord. Flitwick; J.G.D., 1936, det. H. Drabble. [L.].

*100/9. CERASTIUM TETRANDRUM Curt. Railway, north of Dunstable; E.M.-R., 1944: railway between Westoning and Flitwick; E.M.-R. and J.G.D., 1944. [L.B.K.].

*117/4. MALVA ROTUNDIFOLIA L. (M. PUSILLA Sm.). Gravel pit, Eaton Socon; B. Verdcourt, 1944. [L.].

*†123/1. TILIA PLATYPHYLLOS Scop. Barton, planted; J.G.D., 1939, conf. A. B. Jackson. [L.]. Add in brackets to *C.F.*

123/3. TILIA CORDATA Mill. " In Bedfordshire there are woods where are thousands of (lime trees), e.g. at Chicksands (Sir Osborn's) and in other woods thereabouts ": Letter from J. Aubrey to John Ray, dated 5th August 1691, *John Ray's Correspondence*, 1848, p. 237. As Ray makes it clear that there is only one lime, " *Tilia foemina*," that he knows to grow wild and as E. Milne-Redhead and I found this year (1944) a great quantity of *Tilia cordata* including many old trees at Chicksands, it is at least of long establishment. There are also many trees in King's Wood, Heath and Reach and in Aspley Wood, where Druce recorded it as planted (9). As all these woods are on or near the greensand and it almost certainly occurs in other neighbouring woods, it is probably native on the greensand ridge which crosses the county. [L.]. Remove from brackets in *C.F.*

†127/5. GERANIUM PHAEUM L. Not recorded since Abbot, from whose specimen *English Botany* tab. 322 was drawn, but in Herb. Luton Museum there is a specimen from " Clophill near Kiln garden, July 1890 " (coll. C. Crouch). [L.]. Remove to brackets in *C.F.*

*†133/2. IMPATIENS BIFLORA Walt. Leighton Buzzard; V.H.C., 1940: Billington; V.H.C. and J.G.D., 1940: Stevington; A. W. Guppy, 1941: Turvey; R. Turner, 1941: Bromham; B. West, 1941: Harrold; J.G.D., 1943. [L.].

*†133/3. IMPATIENS PARVIFLORA DC. Flitwick Moor; J.G.D., 1919: where it remained until 1923, det. A. J. Wilmott. [L.].

†153/4b. MEDICAGO DENTICULATA Willd. Leighton Buzzard; A. Poulton (4). There is, however, no specimen in the herbarium of the Bedfordshire Natural History Society. Add to *C.F.*

†154/4. MELILOTUS INDICA (L.) All. Between Edworth and Langford; J.E.L., 1914 (12). Add to *C.F.*

*†163/1. GALEGA OFFICINALIS L. Wymington; 1940: Marston Thrift; 1943; J.G.D. [L.].

†170/1. CORONILLA VARIA L. Wateroft Lane, Sharpenhoe; Miss D. M Higgins (11): Roxton; A. West, 1928 (13): Cardington; L. W. Wilson, 1936, still there 1944. [S.L.]. Add to *C.F.*

178/1. LATHYRUS LATIFOLIUS L. The record in the *Comital Flora* is no doubt based on Abbot's record (1) " Hawnes: Bromham." *English Botany*, tab. 1108, was also supposed to have been drawn from a specimen sent by Abbot in 1802. A specimen named *L. sylvestris latifolius* in Abbot's herbarium is, however, *L. sylvestris* L. (5). It is interesting to note that *L. sylvestris* still grows at Hawnes. It would appear doubtful if Abbot knew *L. latifolius*. *Lathyrus latifolius* now occurs as an introduced plant, e.g. Battlesden: 1944, E.M.-R. and J.G.D. [L.]. Remove to brackets in *C.F.*

*191/2. Agrimonia odorata (Gouan) Mill. Tilbrook, v.-c. 30 [Hunts.]; Swineshead; Rushmere, Heath and Reach; E.M.-R. and J.G.D., 1944. [L.B.].

194/7. Rosa squarrosa Rau. Clapham; Ampthill; Maiden Bower, Houghton Regis; Bromham; as var. *Carioti* (Chamb.) Rouy, coll. H. Phillips (16). Add to *C.F.*

*194/12. Rosa Afzeliana Fr. Deadmansea Wood, Whipsnade; V.H.C. and J.G.D., 1941: det. E. B. Bishop. [L.].

194/18. Rosa obtusifolia Desv. Woburn, etc., coll. H. Phillips (16). Great Hayes Wood, Podington; J.G.D., 1941: det. as " probably var. *capucinensis* Rob. Kell " by E. B. Bishop. [L.]. Add to *C.F.*

*194/19. Rosa tomentosa Sm. Deadmansea Wood, Whipsnade; V.H.C., 1941: det. as var. *dimorpha* (Bess.) Desegl. by E. B. Bishop. [L.].

†195/16. Pyrus germanica (L.) Hook. f. East Hyde Park; Tingrith Park; probably planted (11). [S.]. Add in brackets to *C.F.*

213/1. Drosera anglica Huds. The only known record is by Abbot (1): " Extremely rare. Ampthill Bogs." A specimen in his herbarium is correctly named (5). Remove from brackets in *C.F.* and add " e."

*220/6. Epilobium Lamyi F. Schultz. Deadmansea Wood, Whipsnade; V.H.C., 1940: Warren Wood, Clophill; J.G.D., 1941: East Hyde; J.G.D., 1941: Aspley Wood; J.G.D., 1943, all det. G. M. Ash. [L.].

*220/9. Epilobium lanceolatum Seb. & Maur. Aspley Wood; V.H.C., 1943, conf. G. M. Ash. [L.].

250/3. Carum Petroselinum (L.) B. & H. Southill; J.E.L., 1912 (12). There is a specimen in Saunders' herbarium from Flitwick, 1887. [S., M.2]. Add to *C.F.*

*†302/1. Centranthus rubur (L.) DC. Potton; Abbot, 1798 (2): railway bank, East Hyde; J.G.D., 1936. [L.].

334/2. Pulicaria vulgaris Gaertn. Not recorded since Abbot (1). Add " e " to *C.F.* record.

*†383/7. Senecio squalidus L. Harrold; J.G.D., 1943: Henlow; Sundon; Yelden; Milton Ernest; Luton; J.G.D., 1944; Totternhoe; E.M.-R., 1944: Bedford; C. C. Foss, 1944. [L.B.].

*†383/8. Senecio viscosus L. Bedford; L. W. Wilson, 1936: Battlesden; Skimpot, Dunstable; Luton; J.G.D., 1942: Aspley Wood; V.H.C., 1943: Leighton Buzzard; V.H.C., 1944; Ampthill; J.G.D., 1944: Tilbrook, v.c. 30 [Hunts.]; J.G.D., 1944. [L.].

†399/1. SILYBUM MARIANUM (L.) Gaertn. Sandy; Bedford; Abbot (1): Ampthill Park (6); Ford End, Bedford; J. McLaren: Flitwick; south of Luton (11): Southill Station (14); Bedford; L. W. Wilson, 1936. [L., M.1, M.2]. Add to *C.F.*

†405/15. CENTAUREA CALCITRAPA L. "Rare, Biddenham; Eaton Socon"; Abbot (1): Wilbury Hill; J.E.L., *B.E.C. 1913 Rep.*, 1914, p. 476. Delete "e" in *C.F.*

†425/2. LACTUCA SERRIOLA L. Stagsden; Abbot (2): as var. *dubia* Jord., J.E.L., *B.E.C. 1932 Rep.*: Sundon; J.G.D., 1936, becoming increasingly common throughout the county. [L.]. Add to *C.F.*

439/1. OXYCOCCUS QUADRIPETALUS Gilib. Ampthill Bogs; Potton Marshes; Abbot (1). There is no specimen in Abbot's Herbarium (5) but this is a species scarcely likely to be misidentified. Add with "e" to *C.F.*

446/1. ERICA CINEREA L. Pepperstock; J.S., 1900 (11). There is also a specimen in the Crouch Herbarium gathered by Miss Crouch (no date) from "a heath near Markyate Street." These two stations are probably the same and may be in Hertfordshire or v.c. 20 [Beds.]. [C.S.]. Add with ? to *C.F.*

480/8. GENTIANA GERMANICA Willd. Chalton Cross (11): Sundon; Studham (v.c. 20 [Beds.]); J.G.D., 1943. [S.L.B.]. Add to *C.F.*

480/9. GENTIANA CAMPESTRIS L. It is doubtful if this ever occurred in Bedfordshire. *Gentiana fugax, Autumnalis elatior, Centaurea minoris foliis. A Gentianella fugax quarta* Clus? was recorded by Parkinson *Theatr. Novarum*, p. 407, from two localities. "On the Barton hills upon a waste chalky ground and as you go out of Dunstable way towards Gorek hambury" (c.f. Gerard's earlier citations). Abbot (1) probably on the authority of Parkinson recorded it from Barton Hill; but his herbarium contained no specimen (5). Of doubtful identity. [? perhaps *G. anglica* Pugsl.—A. J. Wilmott.] Add ? in *C.F.*

†482/1. NYMPHOIDES PELTATA (S. G. Gmel.) Rend. & Br. "Stanbridge Ford"; S. A. Chambers, 1894 (11). Specimen in Herb. Lousley labelled "Eggington." Add to *C.F.*

*†486/1. POLEMONIUM CAERULEUM L. Well established by side of Flitwick Moor; E.M.-R. and J.G.D., 1944. [L.].

†500/1. ANCHUSA SEMPERVIRENS L. There is a specimen in the Crouch herbarium from Silsoe Park, 1845: Aspley (3): Leighton Buzzard; J.G.D., 1944. [C.L.B.]. Add to *C.F.*

*506/3. MYOSOTIS SECUNDA A. Murray (*M. repens* G. & D. Don). Luton Hoo; J.G.D., 1936: The Litany, Totternhoe; Roxton; J.G.D., 1941. [L.].

†527/5. VERBASCUM BLATTARIA L. Hart Hill, Luton; F. Wiseman, *J. Bot.*, 1883: Cardington; J.McL. [S.M.1]. Add to *C.F.*

548/5. Rhinanthus stenophyllus Schur. Given for v.c. 30 by Druce in his *Flora of Buckinghamshire* with no details. His herbarium contains no Bedfordshire specimen. Add with ? to *C.F.*

†549/2. Melampyrum arvense L. Stagsden Hill Farm; Miss D. M. Higgins, 1904 (*Wats. E.C. 1904-5 Rep.*, 1906, 21; *B.E.C. 1936 Rep.*, 1937, p. 272): between Stagsden and Astwood; J. Lane, 1914 (13): Bromham; Miss A. Wooding, 1942. Houghton Regis; W. D. Coales, 1944: Turvey; A. W. Guppy, 1944. [L.]. Add to *C.F.*

550/10. Orobanche minor Sm. Recorded by Hillhouse with no locality (3): Ampthill; Flitwick; Harlington; J.S., *J.Bot.*, 1889, p. 211; Ridgmont; Pulloxhill; Henlow; C.C. (11): Holwell, in clover; J.E.L. (14): Bushmead; Col. Battcock, 1937: Bromham; Chalton Cross; J.G.D., 1942: Clophill; B. Verdcourt, 1943. [L.]. Add to *C.F.*

†558/4. Mentha spicata Huds. " Galley Hill, Sutton; 1932, ? remains of cultivation " (14). Add to *C.F.*

558/6. ×Mentha piperita L. var. The *Mentha citrata* of *English Botany*, tab. 1025, was " drawn from " a specimen sent by Abbot from Bedford, 1802; but cf. 178/1. ? Add to *C.F.*

*562/7. Satureia Nepeta (L.) Scheele. " Ravensden; Edgar Evans, 1913, named by Kew " (13).

†565/1. Melissa officinalis L. Wootton; Woburn (3): Battlesden, as garden escape; J.G.D., 1942. [L.]. Add to *C.F.*

577/6. Stachys arvensis L. Near Dunstable (2): Barton Hills; J.S. (6): There is no specimen in Saunders' herbarium and he did not include it in his *Field Flowers of Bedfordshire.* Add ? to *C.F.* record.

586/4. Teucrium Chamaedrys L. " Warden; Rare " (1): The specimen in Abbot's herbarium is correct (5). Add with " e " to *C.F.*

*†613/1. Salsola Kali L. Waste ground, Luton; E.M.-R. and J.G.D., 1944. Probably var. *tenuifolia* Tausch. [L.]. Add in brackets to *C.F.*

*615/10. Polygonum mite Schrank. Goldington; B. Verdcourt, 1944: P. mite × P. Persicaria, Fenlake; E.M.-R. and J.G.D., 1944, det. W. B. Turrill. Fenlake is near to Goldington, closer search will probably reveal the plant in neighbouring parishes. [L.].

618/12. Rumex palustris Sm. Warden Abbey; J.E.L., 1913 (12). [S.]. Add to *C.F.*

†622/1. Aristolochia Clematitis L. The *C.F.* record is probably Saunders (11). It was, however, undoubtedly planted, as Saunders himself admits, in the Flower Garden Wood at Luton Hoo. [S., L.]. Add ? to *C.F.* record.

*†628/9. Euphorbia virgata W. & K. Roadside, Thrale's End, Hyde; J.G.D., 1917: near Kempston; L. W. Wilson, 1936: Rubbish dump, Sundon; J.G.D., 1943: Luton Hoo, Hyde; W. D. Coales, 1944: Roxton; H. B. Souster, 1944; Leighton Buzzard; E.M.-R. and J.G.D., 1944: all det. A. J. Wilmott. [B., L.].

628/11. Euphorbia Cyparissias L. Not recorded definitely since Abbot (2), from whose specimen *English Botany*, tab. 840, was drawn. Other reported discoveries are probably for *E. virgata*. Add "e" to *C.F.* record.

*†628/16. Euphorbia Lathyris L. There is a specimen in Saunders' herbarium collected by J. McLaren at Cardington in 1885: Battlesden; J.G.D., 1936: Souldrop; J.G.D., 1943: Bromham; A. W. Guppy, 1941. [S., L., M.2].

†637/3. Urtica pilulifera L. Shefford, Hamson (13): Cardington; J.McL., see *J.Bot.*, 1884, p. 250. [S., M.1]. Add in brackets to *C.F.*

*642/2. Betula pubescens Ehrh. Lidlington; V.H.C. and J.G.D., 1942: Washer's Wood, Tingrith; J.G.D., 1942: King's Wood, Heath and Reach; A. J. Wilmott, 1943 (first definite record): Aspley Wood; J.G.D., 1943: Melchbourne; J.G.D., 1943: Studham; E.M.-R., 1944. [L.].

659/1. Hammarbya paludosa (L.) Kuntze (Malaxis paludosa (L.) Sw.). Not recorded since Abbot (1), who found it at Potton Marshes, which have since been drained. Add "e" to *C.F.* record.

668/1. Epipactis palustris (L.) Crantz. The *C.F.* record is apparently based on Abbot (1). There is also a specimen in the Crouch herbarium collected at Gravenhurst in 1842, since when it has not been reported. [C.]. Add "e" to *C.F.* record.

669/18. Himantoglossum hircinum (L.) Koch (*Orchis hircina* (L.) Crantz). Dunstable Downs; Miss S. Tearle, *J.Bot.*, 1932, p. 114, and *B.E.C. 1932 Rep.*, 1933, pp. 117 and 674. Add to *C.F.*

672/2. Ophrys sphegodes Mill. Not recorded since Abbot (1), who only recorded it from "old sand and gravel pits," Southill, on the authority of P. Walker. Add ? and "e" to *C.F.* record.

†684/3. Narcissus biflorus Curt. Heath; G. C. Druce, 1929, *B.E.C. 1929 Rep.*, 1930, p. 139. Add to *C.F.*

†685/1. Galanthus nivalis L. "Sandy hills, Rare"; Abbot (1): Southill; J.McL. (4). There is a specimen in Saunders' herbarium from Flitwick Park, 1884: Rowney Warren, Shefford; V.H.C., 1939: Tingrith; J.G.D., 1943. [L., S., M.1, M.2]. Add to *C.F.*

*†686/2. Leucojum aestivum L. Tingrith Park; J.G.D., 1918: Bolnhurst; R. Turner, 1941. [L.]. Add in brackets to *C.F.*

†703/1. Muscari racemosum DC. Leagrave; Miss Lye, 1909 (11). Add in brackets in *C.F.*

†708/1. Lilium Martagon L. Recorded by Hillhouse with no locality (4). Pavenham; Miss G. H. Day, 1943. It has been known at Pavenham some years and is probably the source of Hillhouse's record. [L., B.]. Add to *C.F.*

710/1. Tulipa sylvestris L. Not recorded since Abbot (1). Add "e" to *C.F.* record.

713/1. Colchicum autumnale L. Not recorded as a wild plant since Abbot (1). Add "e" to *C.F.* record.

714/1. Narthecium ossifragum (L.) Huds. Not recorded since Abbot (1). Add "e" to *C.F.* record.

719/3. Luzula Forsteri (Sm.) DC. Hamson wrote " there is one doubtful record for Marston " (10). In his notes (13) he attributes this to Miss Ada Stimson, 1878. This record is now confirmed, the author having found the plant at Marston Thrift in 1943. [L., B.]. Add to *C.F.*

737/27. Potamogeton trichoides Cham. & Schlecht. Southill Park Lake; J.E.L., *J.Bot.*, 1938, p. 166. Add to *C.F.*

744/1. Cyperus longus L. Well established on an island in the river at Bedford, where it may have been originally planted; E.M.-R. and J. E. Dandy, 1944. [L.]. Add in brackets to *C.F.*

748/2. Rhynchospora alba (L.) Vahl. Not recorded since Abbot (1). Add " e " to *C.F.* record.

749/1. Schoenus nigricans L. Not recorded since Abbot (1). Add " e " to *C.F.* record.

*753/1. Carex Pseudo-cyperus L. Battlesden; E.M.-R., 1944. [K.L.].

753/4. Carex vesicaria L. Saunders (*J.Bot.*, 1889, p. 212) attributed the discovery of this at Flitton Moor to J. McLaren, while his *Field Flowers of Bedfordshire* also gives McLaren as his authority and North Bedfordshire (with no station) as the only details. There is no specimen in Saunders' herbarium, and a plant named *C. vesicaria* from Shefford is represented in McLaren's herbarium [M.2] by *C. rostrata* (det. E. Nelmes, 1945). A specimen in Charles Crouch's collection of plants " per J.S.," i.e. received from Saunders and collected in North Bedfordshire by McLaren, is *C. riparia*. In McLaren's other herbarium [M.1] there is a specimen of *C. vesicaria* from Ar. Bennett labelled " Copthorne " which is not in Bedfordshire (? Sussex). Delete from *C.F.*

753/12. Carex strigosa Huds. Not recorded since Abbot (1). Add " e " to *C.F.* record.

753/17. Carex distans L. Stevington, rare; Abbot (1). The specimen in Abbot's herbarium was, however, referred to *C. binervis* by Pryor (5). It is likely with non-acid soils at

Stevington that the plant here was *C. distans* and not *C. binervis*. Chorlton (? Chalton), 1882; Streatley, 1883: Totternhoe, 1884; J.S. as (*C. fulva*) but *C. distans*, det. E. Nelmes, 1945. Fancott; A. J. Wilmott, 1942. [L.S.]. Add to *C.F.*

753/21. Carex lepidocarpa Tausch. A specimen in Saunders' herbarium from Totternhoe, 1884, named *C. flava* is referred to this by Mr Nelmes. [S.]. Add to *C.F.*

753/22. Carex serotina Mérat (*C. Oederi* auct. non Retz.). I have been unable to find any evidence for the *C.F.* record: but there is a specimen in McLaren's herbarium [M.1] which is this (det. A. J. Wilmott) labelled " Flitwick, Potton " and named *C. flava*.

753/57×59. × Carex axillaris Good. Fenlake; J.McL., 1884 (10). [S., M.2]. Add to *C.F.*

†754/10. Panicum sanguinale L. " Pulloxhill; C.C." (11). There is a specimen in Saunders' herbarium collected by Mr Green at Luton, 1916. [S.L.]. Add to *C.F.*

*†754/11. Panicum Ischaemum Schreber. There is a specimen in Herb. McLaren, " a garden weed, Cardington." [M.1]. Add to *C.F.*

*780/2(2) [" 3 var."]. Agrostis gigantea Roth. (*A. capillaris* L. var. *nigra* (With.)). Heath and Reach; J.G.D., 1943, det. C. E. Hubbard. [L.].

*†782/1. Polypogon monspeliensis (L.) Desf. Gravel pit, Eaton Socon; B. Verdcourt, 1944. [L.].

†808/1. Cynosurus echinatus L. Bedford; 1916 (13): Flitwick Moor; J.G.D., 1917: Ridgmont; C.C., 1921 (15): Leagrave; J.G.D., 1922; Ampthill; C.C., 1922 (15): Potton; J.G.D., 1942. [S., L.]. Add to *C.F.*

*825/3(2) ["2 (bis)"]. Glyceria declinata Bréb. Heath and Reach; C. E. Hubbard, 1944: Woodside; J.G.D., 1944. [L., K.].

*827/19(2) [" 30 "]. Bromus lepidus Holmberg (*B. britannicus* Williams). Heath and Reach; A. J. Wilmott, 1943, conf. C. E. Hubbard: Knotting; J.G.D., 1944, det. C. E Hubbard. [B., K., L.].

829/2. Lolium temulentum L. Not recorded since Abbot (1). Add with " e " to *C.F.*

844/3. Equisetum sylvaticum L. Not recorded since Abbot (1). Add with " e " to *C.F.*

844/7. Equisetum hyemale L. Not recorded since Abbot (1). Add "e" to *C.F.* record.

†856/2×3 [" 2 bis "]. ×Dryopteris uliginosa Newman. " Flitwick Marsh," 12/9/84 and 8/10/85, J.S. (as *spinulosa* var.), in Herb. Saunders [S.], where Mr J. G. Baker writes:—"*Spinulosa* slides gradually into *uliginosa*. This will scarcely do for the latter: teeth too deep and sharp." Two fronds in Herb.

McLaren [M.1] are referred by A. H. G. Alston to *D. dilatata* and *D. spinulosa* respectively, the latter frond matching those in Hb. Saunders. It is interesting to note that *D. cristata* (L.) A. Gray is not recorded.

856/8. DRYOPTERIS THELYPTERIS (L.) A. Gray. Not recorded since Abbot (1). Add "e" to *C.F.* record.

864/1. OSMUNDA REGALIS L. " Aspley Wood. Found by Mr George Dixon of Eversholt. Rare "; Abbot (1). Recent records are for naturalised plants, e.g. Tingrith Park; J.S., *J.Bot.*, 1889, p. 212. [S.]. Remove to brackets in *C.F.*

865/1. BOTRYCHIUM LUNARIA Sw. Not recorded since Abbot (1). Add "e" to *C.F.* record.

870/6. LYCOPODIUM INUNDATUM L. Not recorded since Abbot (1). Add "e" to *C.F.* record.

*876/17. CHARA DELICATULA Ag. Rushmere, Heath and Reach; E.M.-R. and J.G.D., 1944, det. G. O. Allen. [L.].

ADVENTIVE FLORA OF BURTON-ON-TRENT.

R. C. L. BURGES.

In the B.E.C. Report for 1931, p. 465, a list of 188 adventive plants found at Burton was compiled by Sir Roger Curtis, who was usually accompanied by Dr Druce in his visits to the waste ground in and about the maltings.

During the past ten years more than half of these adventives have been seen by myself, and although the war has greatly restricted my visits there is abundant evidence that Burton is still a prolific field for aliens.

It will be noticed both in Sir R. Curtis' list and the additions listed at the end of these notes that the great majority of these plants came from the Mediterranean region. I believe that the explanation of this is the undoubted fact that the grain sacks from North Africa and Syria contained a much greater quantity of refuse than those from California and Chile, where presumably more modern methods of cleaning the barley are in operation. Barley has not been obtained from North Africa for a good many years before the war, and some of the older workmen at Worthington's maltings were very contemptuous about the contents of the sacks from this part of the world. In the years immediately preceding the war, I believe that most of the foreign barley used at Burton came from California and Chile. The Californian poppy, *Eschscholzia californica* Cham., I feel sure, came from this source, and now it can always be found at one or more of the maltings.

The aliens from America, with the above exception, do not seem to last more than one season, and the more permanent plants all come from the Mediterranean region.

Needless to say, no foreign barley has been imported since the war, and so the plants that are to be found now will be, with a few exceptions, either perennials which can live through our winters or annuals which can set seed successfully. The finding of *Trigonella aurantiaca* Boiss. in 1943 can only be accounted for by the assumption that the seed must have lain dormant in some corner of the malting for many years, and been thrown out with more recent waste onto the adjoining allotments. The four main localities that have been worked are:—

(1) Bass's Brewery, Shobnall Road. The vast expanse of waste ground behind and around Bass's Brewery was in all probability the most prolific area explored by Sir R. Curtis and Dr Druce. It consists of railway lines, allotments, a large area between the sheds covered by loose ash, and at the back of the main buildings waste sandy gravel. In view of the great improvements in dealing with the waste products from the maltings not many fresh aliens have been found here, but it contains several interesting established plants.

Herniaria hirsuta L. has been seen since 1936 and is now greatly extending its range: for the last two years it has been found both on the gravel bank at the back of the main buildings, where I first found it, and also all over the loose ash and between the railway sleepers.

Several interesting species of *Lepidium* are to be found, notably *L. Draba*, *L. chalepense*, *L. virginicum*, and *L. neglectum*; these last two have probably been introduced with the timber for the barrels. Further study in this difficult genus is likely to add to this list.

In the allotments opposite the coopering yards are four weeds which have appeared consistently for the past eight years: *Galium spurium* L. var. *Vaillantii* DC., *Senecio vulgaris* L. var. *radiatus* Koch, *Veronica agrestis* L. var. *Garckiana* D. Fourn., and *Mercurialis annua* L.

Chenopodium glaucum L. is usually to be found growing along the railway tracks, together with *Atriplex patula* L. var. *bracteata* Westerl. and var. *angustissima* G. & G.

(2) Worthington's Maltings S.W. of the main L.M.S. station and the railway sidings at Wetmoor Road N.E. of the station. These two sites, with very similar conditions for the growth of aliens, both lie beside the main L.M.S. line from Derby to Birmingham, and they have provided the majority of the casual aliens seen. The presence of a chicken run, allotments and a ditch which is dry in summer, all a stone's throw from the malting house, are the chief reasons for the frequency of aliens in these sites. The main block of aliens were all found in 1936 and 1937 growing from a load of waste dumped by the side of the railway line. A brief description of the vegetative growth on a typical dump will, I think, not be out of place. By the side of the railway on a bank approximately five feet high a load of waste from the maltings was dumped, covering an area of 6 yards by 3 yards and having a maximum depth of about 3 to 4 feet. When I first saw it in the autumn of 1935 it consisted of a mass of chaff and other waste products from the maltings and looked just like the present fowl balancer meal. In 1936 an abundance of aliens appeared, their growth aided considerably by the heat generated in the middle of the heap. They were massed very closely together, and it was a simple process to sit on the heap, and both inspect and gather the plants at one's ease. In 1937 there were still a goodly number of aliens, but they were finding it difficult to compete with the persistent native grasses, and by 1938 almost all the alien plants had disappeared.

On the waste ground round the maltings and in the grass between the sidings are several alien plants which have persisted to my knowledge for the past ten years, and obviously had been present for many years before I began to visit Burton regularly. A list of these is given for they may be regarded as reasonably permanent, as they are unlikely to be lost, unless drastic alterations take place in and about the railway sidings.

Silene anglica L. is fairly frequent on the permanent way. *Astragalus odoratus* Lam. forms three separate patches, each occupying several square yards. This plant is most difficult to eradicate, as one local botanist, who introduced it to his garden, learnt to his cost. It is able to survive burning and the competition of native vegetation. One patch has just re-appeared after having been entirely covered for several years by a huge dump of coal. *Coronilla varia* L. is on the railway bank.

Medicago falcata L. and *Medicago sativa* L. are both fairly common growing together with many intermediate forms. There is one patch of *Lathyrus tuberosus* L. growing by the main railway bank at Wetmoor Road.

Scattered about are several robust plants of *Salvia verticillata* L., and there is one small patch of what is probably *Salvia sylvestris* L. by the main line at Wetmoor Road. *Polygonum cognatum* Meissn. cannot, I think, be a grain alien, but as there is a timber yard nearby, it seems likely that this was the method of introduction.

In and about the chicken run and allotments are usually to be found *Medicago hispida* Gaertn. var. *denticulata* Willd. and var. *apiculata* Willd., *Melilotus indica* (L.) All., *Vicia narbonensis* L., *Vicia calcarata* Desf., *Centaurea solstitialis* L., *Centaurea melitensis* L., and *Anagallis foemina* Mill. The above I have seen almost every year since 1933, and, in addition, the following plants have recurred fairly frequently: *Glaucium corniculatum* (L.) Curt., *Vicia tenuifolia* Roth., and *Althaea hirsuta* L. The last named was first seen in 1930 by Sir Roger Curtis, and by myself in 1934 and 1943.

(3) Railway sidings by Trent Bridge. The most interesting alien found here is *Alyssum incanum* L., which has appeared regularly for the past ten years, but there are only a few plants, and its hold must be considered precarious. Scattered about the platform and adjoining waste ground are *Sisymbrium altissimum* L., *Sisymbrium orientale* L., *Epilobium roseum* Schreb., *Epilobium adenocaulon* Hausskn., *Senecio viscosus* L., *Senecio squalidus* L., and *Erigeron canadensis* L.

In addition to the above, on any suitable waste ground in and about the town grow *Reseda lutea* L., *Melilotus alba* L., *Scabiosa arvensis* L., *Artemisia Absinthium* L., *Centaurea Scabiosa* L., *Cichorium Intybus* L., and other cornfield weeds.

LIST OF ADDITIONS TO THE 1931 LIST.

28/1. ESCHSCHOLTZIA CALIFORNICA Cham.—Calif.
32/13. FUMARIA PARVIFLORA Lam., det. J.E.L.
32/14. FUMARIA AGRARIA Lag., det. J.E.L.—S. Eur.
38/1. MICROSISYMBRIUM LASIOPHYLLUM (Hook. & Arn.) O. E. Schulz, det. J.P.M.B.—N.W. Am.
42/9. ALYSSUM INCANUM L.—Eur.
55/3. DIPLOTAXIS ERUCOIDES DC., det. J.F.G.C.—S. Eur.
72/1. MYAGRUM PERFOLIATUM L., det. J.F.G.C.—Eur.
74/1. BUNIAS ORIENTALE L., det. J.F.G.C.—Eur.

76/4. Rapistrum Linnaeanum Boiss. & Reut., det. J.E.L.—Eur.
85/2. Reseda lutea L.
115/2. Althaea hirsuta L., det. J.E.L.
116/5(2). Lavatera punctata All., det. J.F.G.C.
117/7. Malva nicaeensis All., G. C. Druce in *B.E.C. 1930 Rep.*, 339—S. Eur.
126/1. Tribulus terrestris L., det. J.P.M.B.—S. Eur.
152/14. Trigonella arabica Delile, det. J.F.G.C.—Arabia.
152/20. Trigonella aurantiaca Bois., 1943, det. J.E.L.—As. Min.
153/19. Medicago tuberculata Willd., det. J.P.M.B.—Medit.
153/27. Medicago laciniata Mill., det. P.A.—S. Eur.
153/34(2). Medicago Blancheana Boiss., det. J.P.M.B.
169/2. Scorpiurus subvillosa L., det. J.P.M.B.—S. Eur.
169/4b. Scorpiurus muricatus L. var. laevigatus (Sibth. & Sm.) Boiss., det. J.P.M.B.
172/3. Hippocrepis unisiliquosa L., det. J.F.G.C.—S. Eur.
173/3. Onobrychis crista-galli Lam., det. J.F.G.C.—Medit.
176/2. Vicia tenuifolia Roth., det. R.M.—Eur.
176/6. Vicia dasycarpa Ten., J.F.G.C.—Eur.
176/9b. Vicia lutea L. var. caerulea Archang.
176/13c. Vicia angustifolia (L.) Reichard var. segetalis Koch.
176/16. Vicia benghalensis L. (*V. atropurpurea* Desf.), det. R.M.—Eur.
176/21. Vicia calcarata Desf., det. P.A.—Medit.
178/17. Lathyrus annuus L., det. J.F.G.C.—Medit.
178/20. Lathyrus hierosolymitanus Boiss., det. J.P.M.B.—Syria.
178/24. Lathyrus amoenus Fenzl.—Syria.
180/3. Pisum humile Boiss. & Noë, det. J.F.G.C.—Palest.
220/7(2). Epilobium adenocaulon Haussk., det. G.M.A.
220/8. Epilobium roseum Schreb., det. G.M.A.
249/1b. Ammi majus L. var. glaucifolium (L.) Noul., det. J.P.M.B.—S. Eur.
249/2. Ammi Visnaga (L.) Lam.—S. Eur.
252/1. Falcaria vulgaris Bernh. (*F. Rivini* Host).
283/1. Caucalis leptophylla L., det. J.E.L.—Eur.
296/12b. Galium Vaillantii DC., det. J.F.G.C.
320/3. Erigeron canadensis L.—N. Amer.
335/1. Buphthalmum speciosum (Schreb.) Druce, 1943, det. J.E.L.—Eur.
354/1. Galinsoga parviflora Cav.—S. Amer.
368/5. Anthemis Cota L. (*A. altissima* L.).—Eur.
383/10e. Senecio vulgaris L. var. radiatus Koch.
396/13. Notobasis syriaca (L.) Cass., det. J.F.G.C.—Medit.
405/35b. Centaurea sp. (C. pallescens Delile var. hyalolepis Boiss., det. J.F.G.C.).
405/42. Centaurea Verutum L., det. J.F.G.C.—Asia Minor.
407/1. Carthamus lanatus L.—S. Eur.
408/1. Scolymus hispanicus L.—S. Eur.

412/1. Rhagadiolus edulis Gaertn., det. J.P.G.C.—Eur.
425/2. Lactuca Serriola L.
428/6. Tragopogon hybridus L., det. J.F.G.C.—S. Eur.
467/2. Anagallis arvensis L. subsp. phoenicea (Scop.) Schinz & Keller, det. F.E.W.
500/2. Anchusa italica Retz.—Eur.
512/1. Ipomoea purpurea (L.) Lam., det. J.F.G.C.—Trop. Amer.
513/2. Convolvulus althaeoides L., 1943, det. J.E.L.—S. Eur.
513/5. Convolvulus pentapetaloides L., det. J.F.G.C.—Asia Min.
517/7. Solanum rostratum Dunal.—Mexico.
518/7. Physalis peruviana L.—S. Amer.
524/1. Hyoscyamus niger L.
532/3. Linaria repens (L.) Mill.
543/19c. Veronica agrestis L. var. Garckiana D. Fourn., det. J.F.G.C.
553(2)/1. Martynia Louisiana Mill., det. P.A.—Amer.
566/12. Salvia sylvestris L. (Determined by P.A. as *S. elata* Host = *S. pratensis* L. × *sylvestris* L.
588/11. Plantago Psyllium L., det. J.F.G.C.—Eur.
596/9. Amaranthus albus L.—N. Amer.
600/8(2). Chenopodium reticulatum Aellen, det. J.P.M.B.
615/25. Polygonum cognatum Meisn., det. P.A.—Himalaya.
618/2. Rumex domesticus Hartm., G. C. Druce in *B.E.C. 1932 Rep.*, 109.
619/1. Emex spinosa Campd., det. J.F.G.C.
628/9b. Euphorbia virgata W. & K. f. esulifolia Thell.
630/1. Ricinus communis L.—Trop.
635/1. Cannabis sativa L.—Asia.
765/7b. Phalaris paradoxa L. var. praemorsa Coss. & Dur., det. C.E.H.
784/1. Gastridium lendigerum (L.) Gaud.
827/13. Bromus unioloides H.B.K., det. J.P.M.B.—Amer.
827/20. Bromus molliformis Lloyd.
828/3. Brachypodium distachyon (L.) Beauv.

Almost all the above have been seen by myself *in situ*. I am very grateful to Messrs P. Aellen, G. M. Ash, J. P. M. Brenan, J. F. G. Chapple, C. E. Hubbard, J. E. Lousley, R. Melville, and F. E. Weiss, without whose expert assistance the identification of most of the above alien plants would have been impossible.

AUTUMN BOTANISING AT LOCHINVER (WEST SUTHERLAND).

A. J. Wilmott and M. S. Campbell.

The fishing village of Lochinver, at the head of the sea loch of the same name, lies remote in the south-west corner of Sutherland. Through it runs a coast road south via Inverpolly to Ullapool and north via Stoer and Drumbeg to Kylestrome. Inland a road runs near the R. Inver to Loch Assynt (which the river drains) and Inchnadamph. The magnificent country of rocky hill and moorland is dominated by the towering mass of "The Grey Castle," Suilven, and on fine days the open views from eminences have for backcloths the fine mountains Quinag, Canisp, Cùl Mòr, Stac Polly, and even Ben More Coigach. Every turn in the road unfolds a scene worthy of an artist's brush. The rock is for the most part grey Lewisian Gneiss, but there are considerable areas of the red Torridonian Sandstone, and some of the mountains, which rise suddenly from the moorland, are capped by a layer of Cambrian quartzite.

Geologically the district was recently described by Macgregor and Phemister (1937: 8): "The Lewisian gneiss forms an undulating plateau with an elevation that varies, as a rule, between 500 and 1000 ft., showing an endless succession of ridges and low hills of bare rock among which lie innumerable lochs. Above this plateau rise the great piles of nearly horizontal Torridonian sediments which build up the detached mountain masses of Quinag (2653 ft.), Canisp (2779 ft.), Suilven (2399 ft.), and Cùl Mòr (2786 ft.)," on which "white Cambrian Quartzites . . . produce gleaming escarpments and long dip slopes—as on the eastern face of Quinag, Canisp, and Cùl Mòr—in striking contrast to the dark red Torridonian sandstones and to the grey hummocky gneiss." The 1″ Geological Survey map (107) of 1881 shows the Stoer Peninsula to be composed of Torridonian rocks. The coastal sands are botanically important as they are strongly calcareous from comminuted shells. About two miles to the north of Lochinver, a branch road leads to the fine sandy bay at Achmelvich, and other extensive accumulations of sand exist at Clachtoll, Stoer, and Clashnessie, all of which we examined. The map shows another sandy bay at Balchladich, but when we enquired for it we were told that it had been completely removed by one of those severe Atlantic storms to which the coast is subject.

This paper, a contribution towards a Flora of West Sutherland, originates from an invitation from Mrs Campbell to spend the latter part of September 1943 at Lochinver. As the district has been little visited by botanists, and the vice-county as a whole is very incompletely known, a list was made on the journey north of all species not recorded in the *Comital Flora* for vice-county 108 which had been recorded from one or other of the (better worked) neighbouring vice-counties. The result of keeping a special look-out for these species was so far successful in filling several gaps (in some measure due to the fact that no note had previously been made of some common species) that a similar plan is recommended to anybody wishing to assist in the revision of the *Comital Flora* (now in hand, see Editor's Report, p. 637). A subsequent invitation permitted further collections to be made in 1944, somewhat earlier in September.

The collections were made on a series of short journeys by bicycle from Lochinver, such habitats as looked interesting being fairly intensively worked. No attempt was made to ascend any of the mountains. On a few occasions it was possible to go further afield, owing to the availability of vacant seats in cars making essential journeys.

To avoid unnecessary printing of the year of collection, a summary is given of the excursions made; for places visited both years the date 1943 is to be presumed unless 1944 is stated, as the majority of the specimens were collected in 1943. The place-names used are in accordance with the 1″ Ordnance Survey Map of Scotland, War Revision 1940, Popular Edition sheet 15. Some expeditions took us into West Ross (v.-c. 105), and a list of plants collected in that vice-county is given after the West Sutherland list. Individual discoveries are initialled.

In 1943 the rocks above Loch Culag (just south of Lochinver) were first explored, and the adjacent hillside above them. The Hieracia collected were abnormal second growths to which Mr Pugsley could not (being away from collections) give definite names, but one of them may be the species he recently described as *H. pollinarium* (collected by Mr Hanbury at Lochinver), and these rocks may be the type locality as Hanbury would almost certainly have examined them. Their extent is very limited; collecting there in the future should be severely restricted. The roadside northwards to the top of the divide towards Stoer produced few specimens of interest, but still further north plants were later collected in Loch an Ordain, in a gorge above Port Alltan na Bradhan (where *Vicia Orobus* was locally abundant), and near the sea at Clachtoll (where *Desmazeria loliacea* was found on sand-covered Torridonian coastal rock). The hillsides on both side of Lochinver Bay were examined, and also some distance up the R. Inver. The amount of scattered *Quercus Robur* (not previously recorded for v.-c. 108) in the birchwoods was surprising, and seedlings were noted in heather near the R. Inver, as well as seedlings of *Fagus sylvatica* from trees planted by the bridge. A visit to Drumbeg showed that *Quercus Robur* also occurred in the birch-woods there; the small salt marsh where the road crosses the Oldany River was examined, and *Osmunda* was collected by Loch Eilannach. Rocks on the east side of Clashnessie Bay a little north of Imirfada produced nothing exciting. Perhaps our most interesting discovery—*Cephalanthera longifolia*—was made by the side of the Achmelvich road not far from Achadantuir, where some basic rocks bore Sanicle and Woodruff, *Carex pallescens*, *Vicia Orobus*, and an *Epipactis* too withered for critical determination. A midden at Feadan bore *Arctium vulgare*, and near Achmelvich *Vicia Orobus* was collected again. *Coelo-*

glossum viride was seen at the edge of Achmelvich Bay. As we returned from an excursion southwards into West Ross an interesting *Viola* was collected between Inverkirkaig and Strathan.

In 1944 several visits were made to Achmelvich Bay and vicinity, where there is a fine development of machair. Remains of Orchids indicated the need for further collections earlier in the year. *Gentiana septentrionalis* spangled the sward, *Ophioglossum* was occasionally seen, and *Coeloglossum* was abundant, though not as much so as in Harris and Lewis. South of Lochinver, a rocky gully north-east of Inverkirkaig below Loch Bad-na-Muirichinn produced a fine aphyllopodous *Hieracium*. A near-by hill bore a narrow-leaved variety of *Arctostaphylos Uva-ursi* and a beautiful lemon-yellow coloured *Narthecium*. An excursion to Stoer and Balchladich led to the discovery of several Potamogetons at the edge of the lochan held up by the sand at Stoer Bay: *Sagina nodosa* lined the slight bank at the edge of the lochan. Another visit to Clashnessie Bay produced an interesting hybrid rose, and *Juncus macer* was found by the roadside a little distance from the coast. A short time was spent on the lower slopes of Creag Mhor, Quinag. A loch between Lochinver and Ardroe contained *Sparganium minimum* and interesting sedges. Plants which appeared to be hybrids between *Juncus conglomeratus* and *J. effusus* were collected by the roadside at Lochinver.

The area is one which merits further examination in other seasons. There is considerable variety of habitat, a fair amount of birch wood, several lochs to be dragged, and fine mountains to be ascended. A reason for rather extensive collecting was to compare with specimens from the same geological formations across the Minch in the Outer Hebrides.

In concluding this introduction, we wish to thank Mrs Campbell for her hospitality, Dr Turner of Lochinver for taking us further afield than bicycles permitted, and the following for assistance in identifications:—

Mr W. C. Barton (*Rubus*).
Messrs J. E. Dandy and G. Taylor (*Potamogeton*).
Dr W. O. Howarth (*Festuca*).
H. W. Pugsley (*Hieracium, Euphrasia*).

The following publications will be found useful by those visiting the district:—

Ling, W. N., and Corbett, J. R.: 1936: The Northern Highlands (*Scottish Mountaineering Club Guide*).

MacGregor, M., and Phemister. J.; 1937: *Geol. Excurs. Guide to the Assynt District of Sutherland* (Edinburgh Geol. Soc.), pp. 62 (2/-).

2/2(3). THALICTRUM MONTANUM Wallr. Coastal rocks, Clachtoll.

6/3. RANUNCULUS ACER L. Clachtoll, the usual fine-flowered short machair form which is nearest var. *tomophyllus* (Jord.); with narrower leaf segments at Stoer, 1944 (M.S.C.).

[*]6/22. **Ranunculus trichophyllus** Chaix ap. Vill. ? Lochan at Stoer; without flower and needing confirmation.

8/1. **Trollius europaeus** L. Gorge above Port Alltan na Bradhan; coastal rock ledge at Clachtoll; rocky valley at Achmelvich (M.S.C.).

32/10. **Fumaria officinalis** L. Weed in garden of Culag Hotel, Lochinver.

39/4. **Cardamine flexuosa** With. South of Lochinver; roadside ditch between Lochinver and Stoer; stamens 6.

39/5. **Cardamine hirsuta** L. Garden weed, Culag Hotel (1944).

45/6. **Cochlearia scotica** Druce. On a tiny extent of salt marsh below the church, Lochinver (1944: A.J.W.); sea rocks, Balchladich Bay.

80/1c. **Raphanus Raphanistrum** L. var. **aureus** Wilmott. Drumbeg.

88/4. **Viola Riviniana** Rchb. In flower between Achadantuir and Feadan.

88/11. **Viola palustris** L. With small but shortly pointed leaves between Lochinver and Stoer, and with large acute leaves like those of *V. Juressi* K. Wein (*V. epipsila* auct. angl. non Ledeb.; see Wilmott in Bab. *Manual*, ed. x, 574) in the rill running down to Lady Constance Bay from the hill south of Lochinver.

*88/21. **Viola orcadensis** Drabble. Potato patch near Inverkirkaig.

89/1. **Polygala serpyllifolia** Hose. Gully near Inverkirkaig, still in flower, 11th September 1944.

98/4. **Lychnis dioica** L. var. A coarse fleshy plant. Among bushes near the Oldany River west of Drumbeg; coastal rocks, Clashnessie.

103/1. **Sagina nodosa** L. Fringing the edge of Stoer Pond (M.S.C.); Achmelvich (M.S.C.).

103/2. **Sagina subulata** (Sw.) Presl. Gorge above Port Alltan na Bradhan.

105/3. **Spergularia salina** J. & C. Presl. Salt marsh by Oldany River, west of Drumbeg.

109/1. **Montia fontana** L. em. Neck. (*M. lamprosperma* Cham.). Glen Canisp near Canisp Lodge.

*127/9. **Geranium dissectum** L. Garden weed, Culag Hotel, Lochinver, 1944 (M.S.C.).

136/1. **Ilex Aquifolium** L. Lower rocks, Creag Mhor, Quinag (M.S.C.).

*149/2. **Ulex Gallii** Planch. Hillside south of Lochinver, towards Lady Constance Bay.

176/3. **Vicia Cracca** L. Coastal rocks, Imirfada.

176/4. **Vicia Orobus** DC. Rock face between Achandantuir and Feadan: rock ledge near Achmelvich: abundant on rocks in gorge above Port Alltan na Bradhan: also seen further north towards Stoer.

176/8. Vicia sepium L. Drumbeg.

178/6. Lathyrus pratensis L. Edge of marsh near Drumbeg.

178/25. Lathyrus montanus Bernh. South foot of Creag Mhor, Quinag, with ordinary medium-broad leaves (M.S.C.): rocks on east side of Clashnessie Bay, with very broad leaves (M.S.C.).

183/7. Prunus spinosa L. A dense thicket by road between Lochinver and Stoer (1943).

*185/35. Rubus villicaulis Koehl. [" aggr."] det. W. C. Barton. Roadside, Achmelvich (A.J.W.). This was collected because *Rubus fruticosus* L. was not given for v.-c. 108 in the *Comital Flora*. Rogers, however, records (1900: *Handbook of Brit. Rubi*, 101, 102) both *R. villicaulis* and *R. danicus* Focke (as *R. hirtifolius* var.), so the omission should not have occurred. " The only two entries of *R. fruticosus* for v.-c. 108 in Rogers's Rubus Record Book are *R. villicaulis* from Lochinver, E. S. Marshall, 16th July 1890, and *R. danicus* from Tongue, F. J. Hanbury, 27th July 1887; specimens of both gatherings from Herb. Rogers are now in Herb. Barton. The former gathering was recorded by Marshall in *Journ. Bot.*, 1891, 111 ("teste Focke"); the Tongue gathering was recorded in *Journ. Bot.*, 1894, 45, sub nomine *R. mollissimus*."—W. Barton *in litt.*

185/154. Rubus saxatilis L. Rocks south of Lochinver: Achmelvich (1944: M.S.C.).

188/2. Fragaria vesca L. Roadside bank, Achandantuir.

189/25. Potentilla palustris (L.) Scop. A form with narrow leaflets in a ditch north of Lochinver on the way to Stoer, by Loch Eilannach; also in rocky valley at Achmelvich (M.S.C.).

190/4. Alchemilla pseudo-minor Wilmott. Roadside ditch between Achandantuir and Feadan: also further north by the road to Stoer: south foot of Creag Mhor, Quinag.

190/4(2). Alchemilla filicaulis Buser. Stream-bank near Achandantuir (1944); normally hanging over the water, but submerged after heavy rain. This plant was less than 100 yards from one of *A. pseudo-minor* by a roadside ditch, and raises the question whether the more glabrous *A. filicaulis* may be only a state of *A. pseudo-minor* produced by very damp air, but on the other hand, normally hairy *A. pseudo-minor* is often found in very wet meadow land in the Highlands of Scotland.

190/19. Alchemilla alpina L. South foot of Creag Mhor, Quinag, c. 600′.

194. Rosa L. These specimens were named with the assistance of Dr Melville, from Wolley-Dod's account in the *Supplement to the Journal of Botany*, 1931.

*194/6n. Rosa canina L. var. globularis (Franch.) Dum. Achmelvich road near Achandantuir (1944); hips still green, smooth: not collected elsewhere, but thought to have been seen scattered about the district.

194/71. ROSA CANINA L. ? var. SCHLIMPERTI (Hofm.), but the styles are distinctly hispid, and the leaflets are more often 7 and 5. Rocky slope south of Lochinver (1943)—a plant with extremely large leaflets.

194/12e. ROSA AFZELIANA var. GLAUCOPHYLLA W.-Dod (see *Journ. Bot.*, *69*, 104: 1931). Lochinver, north side of the bay (1944).

194/13g. ROSA CORIIFOLIA Fr. var. **setigera** (W.-Dod) comb. nov. Rocky slope south of Lochinver (1943): side of Achmelvich road near Achadantuir (1944), hips then red, hispid. This appears to be the commonest rose in the district, and although the plant collected in 1943 was less setigerous than the others collected in 1944, it does not match the southern specimens of var. *Bakeri* (Déségl.) W.-Dod, under which Wolley-Dod distinguishes his f. *setigera*, and it seems probable that these plants represent a distinct variety which sometimes is less setigerous than usual. Also collected in 107, E. Sutherland, at Invershin Station (A.J.W.).

*194/19a. ROSA TOMENTOSA Sm. var. TYPICA W.-Dod (1931: 86). Side of Achmelvich road near Achadantuir.

194/6×13? ×ROSA (*R. canina* × *coriifolia*). Two plants by Clashnessie Bay, with large globular brilliantly coloured fruits, at the time thought to be, perhaps, hybrids of *R. spinosissima*, are thought by Dr Melville to be probably hybrids between the two commonest roses of the district, viz., 194/6n × 13g. They need further study.

194/23. ROSA SPINOSISSIMA L. Above Loch Eilannach.

199/1. SAXIFRAGA AIZOIDES L. Low roadside rocks south-west of Knochan.

207/1b. RIBES UVA-CRISPA L. var. GROSSULARIA (L.). In boulder scree of gorge above Port Alltan na Bradhan.

213/1. DROSERA ANGLICA Huds. Achmelvich (1943).

216/2. MYRIOPHYLLUM ALTERNIFLORUM DC. Loch an Ordain, between Lochinver and Stoer.

*219/1. LYTHRUM SALICARIA L. Growing on the brick wall of the garden of the Culag Hotel, Lochinver: rocky valley, Achmelvich (1944: M.S.C.).

220/7. EPILOBIUM OBSCURUM Schreb. Garden weed, Culag Hotel, Lochinver (1944).

220/10. EPILOBIUM MONTANUM L. Weed in Culag Hotel garden, a large-leaved form.

220/14. EPILOBIUM PALUSTRE L. Ditch north of Lochinver, with a mass of seedlings about 1½ inches high.

225/3. CIRCAEA ALPINA L. In the crevices of a roadside stone wall about a mile north of Lochinver (1944).

241/1. Sanicula europaea L. Wooded rocky slope between Achadantuir and Feadan: south foot of Creag Mhor, Quinag (1944: M.S.C.).

*265/3. Oenanthe crocata L. Drainage channel by sea in bay south of Strathan (M.S.C.).

271/1. Ligusticum scoticum L. Achmelvich Bay (1944).

282/1. Daucus Carota L. Thinly locally scattered over the district: Achadantuir: seeds sent for cultivation at the John Innes Horticultural Institution from Achmelvich (including short forms on the machair) and Stoer.

284/1b. Hedera Helix L. var. borealis Druce. Rocks south of Lochinver: gully near Inverkirkaig, with variable leaves, some certainly " var. *borealis* " but some leaves as broad as long: lower rocks, Creag Mhor, Quinag.

291/1. Lonicera periclymenum L. Rocks south of Lochinver, the normal thin-leaved pubescent form; some basal leaves = "var. *quercifolia* Ait.," a worthless variety.

296/1. Galium boreale L. Rocks in the R. Inver, Lochinver.

296/11. Galium aparine L. On the beach at Clashnessic, a similar habitat to those in Uig (Lewis); is this its truly native habitat?

298/1. Asperula odorata L. Wooded slope between Achadantuir and Feadan.

328/3b. Gnaphalium sylvaticum L. Slope south of Lochinver: mostly with capitula dark as in var. *nigrescens* Gren., but not extreme in darkness, and some rather pale. One plant (dark) to 24 in. high. Leaves narrow, not broad as in the var., but the plant not precocious as in var. *praecox* F. Schultz (cf. Rouy; 1903: *Fl. France, 8*, 185-6).

*370/13. Chrysanthemum Parthenium L. Garden outcast on the shore above high water mark, but subject to much spray—several plants outside the garden wall, Culag Hotel, Lochinver.

*393/2. Arctium vulgare (Hill) Evans. In a midden at Feadan.

396/3. Cirsium heterophyllum (L.) Hill. Among rocks at the south foot of Creag Mhor, Quinag.

405/8. Centaurea nigra L. (*C. obscura* Jord.). Variable at Achmelvich (1944) where both the entire-leaved form and f. *pinnatifida* (C. E. Britton; 1922: *B.E.C. 1921 Rep.*, 409) occurred and also the f. *longiflora* (C. E. Britton; 1922: 408), together with a plant which appears to fit the description of the "var. *subnemoralis* f. *longiflora* (C. E. Britton; 1922: 410)."

419. Hieracium. Phyllopodous species were only in untypical late growth, a second flowering. Mr H. W. Pugsley refers most of them to *H. vulgatum* Fr., but gatherings near Lochinver (rocks by road to the south) and at the top of the divide between Lochinver and Stoer, may be *H. pollinarium* Pugsl.

419/233. HIERACIUM RETICULATUM Lindeb. ? Rocky valley, Achmelvich (1944: M.S.C.).

419/240. HIERACIUM STRICTIFORME (Zahn) Roffey. Rocky gulley N.E. of Inverkirkaig.

423. TARAXACUM. A peculiar species (or perhaps two): bare sandy edge of machair, Clachtoll; sanded cracks of sloping coastal rocks at Balchladich Bay.

441/1. ARCTOSTAPHYLOS UVA-URSI (L.) Spreng. Hill south of Lochinver: near Inverkirkaig (1944: M.S.C.; with a specimen evidently the "var. *angustifolia* Druce (1929: *1928 Rep., Suppl.* 52; M.S.C. 450911 Ab.).

466/1. GLAUX MARITIMA L. Lochinver, in salt marsh on north side of bay.

480/9. GENTIANA CAMPESTRIS L. A curious tufted much-branched dwarf small-flowered plant on roadside bank on south side of Stoer.

480/5. GENTIANA SEPTENTRIONALIS Druce. Abundant on parts of the machair at Achmelvich (1944) (M.S.C.).

497/1b. SYMPHYTUM OFFICINALE L. var. PURPUREUM Pers. (1805: *Synops.*, *1*, 161). *S. patens* Sibth. (1794: *Fl. Oxon.*, 70). By stream below cottage, Inverkirkaig.

[*]506/1. MYOSOTIS SCORPIOIDES L. emend. Hill. In a ditch running below houses at Inver (Lochinver), presumably introduced at some time.

506/3. MYOSOTIS SECUNDA A. Murray (*M. repens* "G. & D. Don"). Feadan.

506/4. MYOSOTIS CESPITOSA F. Schultz. North end of Balchladich Bay.

506/8. MYOSOTIS ARVENSIS (L.) Hill. Garden weed, Culag Hotel, Lochinver.

535/4. SCROPHULARIA NODOSA L Strathan (1944); two forms, one with much anthocyan, leaves dark green, calyx blackish-purple, the other with light green leaves and without blackish calyx.

537/1d. MIMULUS GUTTATUS DC. var. YOUNGEANA (Hook.) Druce. Ditch between Strathan and Inverkirkaig: ditch on north side of Stoer (1944: M.S.C.).

543/3. VERONICA OFFICINALIS L. Gully near Inverkirkaig.

543/4. VERONICA CHAMAEDRYS L. Culag Hotel garden, Lochinver.

543/18. VERONICA PERSICA Poir. Culag Hotel garden, Lochinver.

543/19. VERONICA AGRESTIS L. Culag Hotel garden, Lochinver.

545. EUPHRASIA. Det. H. W. Pugsley.

545/3. EUPHRASIA BREVIPILA Burn. & Gremli. Rocky slope south of Lochinver ("perhaps f. *tenuiformis* Pugsl.").

545/10. EUPHRASIA OCCIDENTALIS Wettst. Mound by Culag Hotel, Lochinver (1944: A.J.W.).

545/15. EUPHRASIA MICRANTHA Rchb. A specimen on a slope south of Lochinver bore a tiny flower only 4 mm. long in the axil of the first leaf above the cotyledons, the corolla being only as long as the calyx. This flower approaches in its small size a tiny flower obtained by me from the ice-age (so-called " Arctic ") bed at Barnwell near Cambridge.

545/18. EUPHRASIA CONFUSA Pugsl. Roadside bank north of Stoer (M.S.C. : " f. *albida*," Pugsl.).

546/5. BARTSIA ODONTITES Huds. Lane side near Balchladich.

548/6. RHINANTHUS SPADICEUS Wilmott. Remains of what appeared to be this species were seen in a gully near Inverkirkaig and on a rock slope near Achmelvich.

549/3f. MELAMPYRUM PRATENSE L. var. ERICETORUM D. Oliver. In heather on hill south of Lochinver.

[*]552/2. UTRICULARIA NEGLECTA Lehm. ? Lochan at Stoer; without flower but probably this species, the usual one in the north, according to P. M. Hall.

553/4. PINGUICULA LUSITANICA L. Hillside flush on the divide north of Lochinver towards Stoer: Inver (Lochinver), 1944.

558/2. MENTHA LONGIFOLIA Huds. Balchladich—a "throw-out" or escape.

[558/6. ×MENTHA PIPERITA L. Given us at Balchladich as the culinary mint used there, when enquiry was made about the preceding species.]

[*]558/10h. MENTHA GENTILIS L. var. VARIEGATA (Sole) Sm. Escaped among houses at Stoer, and cultivated in garden at Balchladich.

561/10. THYMUS NEGLECTUS Ronniger. Rocky gully north-east of Inverkirkaig (M.S.C.).

572/1. SCUTELLARIA GALERICULATA L. A belt several feet long among stones at the top of the beach, Clashnessie Bay, where the water comes down from a small marsh above.

581/4. LAMIUM HYBRIDUM Vill. Garden weed, Culag Hotel, Lochinver.

581/5. LAMIUM MOLUCELLIFOLIUM Fr. Garden weed, Lochinver.

586/1. TEUCRIUM SCORODONIA L. Rocks south of Lochinver: gully near Inverkirkaig (M.S.C.).

588/3. PLANTAGO CORONOPUS L. Salt marsh north side of bay, Lochinver: coastal rock-slopes, Balchladich.

588/8. PLANTAGO LANCEOLATA L. var. (small with spherical spikes). Top of sand-covered coastal rock, Clachtoll.

606/7a. ATRIPLEX GLABRIUSCULA Edmondst. var. VIRESCENS (Lange) Moss & Wilmott. Salt marsh north side of bay, Lochinver, a very small form: sand-covered cracks and depressions on coastal rocks, Balchladich Bay, a peculiar form.

*615/9. POLYGONUM HYDROPIPER L. Feadan.

637/1e. URTICA DIOICA L. var. HORRIDA (Wedd.) Rouy. (With ovate-orbicular thick coarse-toothed leaves.) Stoer.

642/2b. BETULA GLUTINOSA Wallr. Dominant in the woodlands, from Drumbeg to Lochinver. As Fries says, this, the common northern species, does not seem to be the same as the common more southern species, *B. pubescens* Ehrh.

645/1. CORYLUS AVELLANA L. Common in birch woods south of Drumbeg; common and sometimes a local dominant in birch-woods around Lochinver.

*646/1. QUERCUS ROBUR L. Scattered in birch-woods; Inver (Lochinver); more abundant just south of Drumbeg.

*647/1. CASTANEA SATIVA Mill. A small tree on hill south of Lochinver by the track to Lady Constance Bay [?planted but no evidence].

649/1. FAGUS SILVATICA L. Self-sown in heather by the R. Inver from trees planted by the bridge, Lochinver.

650/1. SALIX PENTANDRA L. Only seen near houses and presumably planted; Strathan and thence south to the border of West Ross, but not seen in that vice-county, for which it is not recorded.

650/7. ×SALIX SMITHIANA Willd. Lochinver, by stream going over to Lady Constance Bay.

650/9×10. ×SALIX CHARRIERI Chass. (see *B.E.C. 1934 Rep.*, 985; *S. atrocinerea* Brot. × *S. aurita* L.). Rocky hillside between Lochinver and Stoer.

650/10c. SALIX ATROCINEREA Brot. var. OLEIFOLIA (Sm.). By path over hill from Lochinver to Lady Constance Bay; with very long stiff leaves.

651/2. POPULUS TREMULA L. *Glabrous* young browsed shoots (c. 6″ above ground only) in gorge above Port Alltan na Bradhan.

652/1. EMPETRUM NIGRUM L. Hill top south of Lochinver: coastal slopes Inverfada (1944).

*667/3. CEPHALANTHERA LONGIFOLIA (Huds.) Fritsch. Wooded rocky slope between Achadantuir and Feadan; a ripe fruit seen 1943, but none in 1944, although several more plants were seen then. Presumably one of the basic sections of the Lewisian Gneiss is responsible for the numerous calcicoles seen on this rocky slope. An interesting extension of range.

668/2. EPIPACTIS HELLEBORINE (L.) Cr. emend. Rend. & Brit. Wooded rocky slope between Achandantuir and Feadan, flowers too withered for critical determination, but apparently not *E. atropurpurea* Rafin.; the broadest leaves varied from large 1¼ times as long as broad to smaller more than twice as long as broad (?more than one form).

669/9. ORCHIS PURPURELLA T. & T. A. Steph. On machair Achmelvich Bay.

669/10. Orchis ericetorum (Linton) E. S. Marshall. Lochinver. Achmelvich.

674/4. Coeloglossum viride (L.) Hartm. Locally abundant on coastal grass, Achmelvich.

714/1b. Narthecium ossifragum Huds. var. **luteum** Campbell & Wilmott. var. nov. (Caulibus, tepalis, capsulisque colore aurantiaco deficit, ergo) caulibus luteo-viridibus, tepalis capsulisque luteis vel luteo-viridibus (vel tepalis apicem versus colore aurantiaco paululum tinctis). Hill east of Inverkirkaig, 1944: M.S.C. (Ref. 440911Bb). A beautiful clear yellow plant, growing with the normally coloured form.

718/3. Juncus conglomeratus L. Common everywhere: collected at Inver (Lochinver) with what appeared to be hybrids with the next species (1944).

718/4. Juncus effusus L. Uncommon (? rare); roadside at Inver (Lochinver) (1944).

*718/16. Juncus macer S. F. Gray. Roadside runnel north of Clashnessie.

719/4. Luzula multiflora (Retz.) DC.

722/5. Sparganium minimum Fr. Edge of Loch (46.5/60.99) above Badidarroch (Lochinver).

737. Potamogeton L., det. J. E. Dandy.

737/2. Potamogeton polygonifolius Pourr. Muddy flush on hill north of Lochinver: outlet stream from Bad-na-Muirichinn.

*737/5. Potamogeton alpinus Balb. Edge of lochan at Stoer.

737/9. Potamogeton gramineus L. Edge of lochan at Stoer.

737/9×16. ×Potamogeton nitens Weber. Edge of lochan at Stoer.

737/16. Potamogeton perfoliatus L. Loch an Ordain: Bad-na-Muirichinn.

*737/23. Potamogeton Berchtoldii Fieb. Edge of lochan at Stoer.

737/30. Potamogeton filiformis Pers. Edge of lochan at Stoer.

745/3. Eleocharis multicaulis (Sm.) Sm. Lochside above Badidarroch, Lochinver.

746/8. Scirpus pauciflorus Lightf. Roadside runnel north of Clashnessie.

746/11. Scirpus setaceus L. Lochinver.

748/2b. Rhynchospora alba (L.) Vahl var. sordida Bab. Roadside bog south of Creag Mhor, Quinag (M.S.C.).

753/8. Carex lasiocarpa Ehrh. Edge of loch (46.5/60.9) above Badidarroch, Lochinver (M.S.C.).

753/21. Carex lepidocarpa Tausch. South of Lochinver towards Lady Constance Bay.

753/22. Carex serotina Mérat. Clashnessie Bay.

753/34. Carex pallescens L. Rock ledge between Achandantuir and Feadan: by Loch above Badidarroch: rocks at south foot of Creag Mhor, Quinag.

765/11. PHALARIS ARUNDINACEA L. Achmelvich (M.S.C.): coastal rocks, Clashnessie.

780/2j. AGROSTIS STOLONIFERA L. var. PALUSTRIS (Huds.) Farwell (det. W. Philipson). Weed in Culag Hotel garden, Lochinver: garden weed at Stoer.

780/3h. AGROSTIS TENUIS Sibth. var. HISPIDA (Willd.) Philipson. Small salt marsh by the Oldany River.

813/1. MOLINIA COERULEA (L.) Moench var. ARUNDINACEA Asch. Above Loch Eilannach.

*820/1. DESMAZERIA LOLIACEA (Huds.) Nyman. Coastal rocks, Clachtoll.

826/7a. FESTUCA RUBRA L. var. VULGARIS Gaud. Mound outside Culag Hotel, Lochinver, very rare.

826/10(2). FESTUCA VIVIPARA (L.) Sm. Forms of this species are common on the lowland rocks throughout the district, and nearly all of them are similar to the commonest form found across the Minch on the Atlantic seaboard of Lewis, i.e. ssp. *norvegica* (Turess.) Wilmott (in Campbell 1945: *Fl. Uig*, 53 & 54). As in Uig the glumes vary in shape and ciliation, and although in most specimens the bulbils are only about 25 mm. long, in some they reach 40 mm. In two gatherings from Lochinver itself glume IV was at least twice as long as glume II, and these specimens would by the key (in *Fl. Uig*), be referable to ssp. *killinensis* (Turess.) Wilmott. But until authentic material of the latter has been seen it is undesirable to make a definite identification since the relative length of glumes II and IV is variable within the " ssp. *norvegica* " and the two gatherings mentioned are not otherwise obviously distinct.—A. J. W.

828/1. BRACHYPODIUM SYLVATICUM (Huds.) R. & S. Rock ledge between Achandantuir and Feadan; Clashnessie.

829/1. LOLIUM MULTIFLORUM Lam. Garden weed, Lochinver (1944).

844/3. EQUISETUM SYLVATICUM L. Rocky gully north-east of Inverkirkaig; burnside by road, Achmelvich (1944).

844/9. EQUISETUM VARIEGATUM L. Roadside bog south of Creag Mhor (M.S.C.).

850/1. PHYLLITIS SCOLOPENDRIUM (L.) Newm. On wall of Culag Hotel garden, Lochinver.

851/1. ASPLENIUM MARINUM L. Coast rocks, Balchladich Bay.

851/2. ASPLENIUM TRICHOMANES L. Rocks at south foot of Creag Mhor, Quinag.

851/5. ASPLENIUM ADIANTUM-NIGRUM L. Wall at Drumbeg, and on bridge over Oldany River about two miles west of Drumbeg: Rocks at south foot of Creag Mhor, Quinag.

851/7. ASPLENIUM RUTA-MURARIA L. Perpendicular rocks of gully near Inverkirkaig.

853/1. ATHYRIUM FILIX-FOEMINA (L.) Roth. Rocks at south foot of Creag Mhor, Quinag.

854/3. POLYSTICHUM LOBATUM (Huds.) Woynar. Rock ledge between Achandantuir and Feadan: rocks at south foot of Creag Mhor, Quinag.

854/4. DRYOPTERIS DILATATA (Sw.) Asa Gray. (*D. aristata* B.P.L.) Rocks by Loch an Ordain, between Lochinver and Stoer.

856/9. DRYOPTERIS PHEGOPTERIS (L.) C. Chr. Gully near Inverkirkaig: rocks at south foot of Creag Mhor, Quinag.

856/10. DRYOPTERIS LINNEANA C. Chr. Lochinver.

857/4. CYSTOPTERIS FILIX-FRAGILIS (L.) Bernh. Roadside wall, Lochinver (M.S.C.).

858/1. POLYPODIUM VULGARE L. Roadside wall north of Lochinver (1944).

864/1. OSMUNDA REGALIS L. By Loch Eilannach.

*866/1. OPHIOGLOSSUM VULGATUM L. Machair at Achmelvich (M.S.C.).

870/7. LYCOPODIUM SELAGO L. By Loch an Ordain, between Lochinver and Stoer: rocky gully near Inverkirkaig.

876/17. CHARA DELICATULA Ag. (det. G. O. Allen). Pool by R. Inver, Lochinver.

PLANTS COLLECTED IN WEST ROSS.

In 1943 the road southwards from Lochinver was taken as far as Loch an Eisg Brachaidh. On rocks above the sea a small patch of *Calamagrostis epigeios* was discovered. By the bridge above Inverkirkaig a *Senecio* was collected which looked intermediate between *S. aquaticus* and *S. Jacobaea.*

In 1944, traversing the same road, we reached Loch Call an Uidhean, above which *Ajuga pyramidalis* was found, and *Calamagrostis epigeios* was seen on hill slopes above the locality found in 1943 A round trip to Knochan via Inchnadamph and back round Stac Polly showed *Ulex Gallii* to be plentiful along the road below Creag Dubh.

*149/2. ULEX GALLII Planch. Below Creag Dubh along the road between Cnochan and Loch Lurgainn (M.S.C.).

190/4. ALCHEMILLA PSEUDO-MINOR Wilmott. Roadside runnel on hill north of Loch Eisg Brachaidh (1944: A.J.W.).

271/1. LIGUSTICUM SCOTICUM L. By Loch Eisg Brachaidh (1944: M.S.C.).

312/1. SOLIDAGO VIRGAUREA L. Large branching large-flowered plants by Loch Eisg Brachaidh (1944).

383/3×5?. ×SENECIO OSTENFELDII Druce? (*S. aquaticus* × *Jacobaea*?). With putative parents just across the bridge above Inverkirkaig; the specimens collected are apparently sterile.

393/6. Cirsium heterophyllum (L.) Hill. By the coast road opposite Loch Eisg Brachaidh (1944: M.S.C.).

419/240. Hieracium strictiforme (Zahn) Roffey (det. H. W. Pugsley). Roadside rocks on hill north from Loch Eisg Brachaidh (1944: A.J.W.).

587/2. Ajuga pyramidalis L. Slope north of Loch Call an Uidhean (M.S.C.): very rare in W. Ross and not seen there by Druce (1929: *Fl. W. Ross*, 68).

642/2b. Betula glutinosa Wallr. This seems to be the dominant tree in the scattered woodlands; collected opposite Loch Eisg Brachaidh and farther south in Allt Gleann an t-Srathain, where there is an extensive woodland.

643/1. Alnus glutinosa (Mill.) Gaertn. By woodland stream, Allt Gleann an t-Srathain. (Generally rather uncommon.)

718/15. Juncus Gerardi Lois. Salt marsh at south end of Loch Eisg Brachaidh.

737/1. Potamogeton natans L. Loch an Arbhair (south of Inverkirkaig).

753/19. Carex Hostiana DC. Ditch near Inverpolly.

753/22. Carex serotina Mérat. Roadside runnel south of Knoehan.

753/34. Carex pallescens L. Roadside rocks opposite Loch Eisg Brachaidh.

780/2j. Agrostis stolonifera L. var. palustris (Huds.) Farwell (det. W. Philipson). Shore at Loch Eisg Brachaidh, with a diseased form (nematode worms in ovary)

*783/1. Calamagrostis epigeios (L.) Roth. Sea cliff and near-by slope, by Loch Eisg Brachaidh.

826/7e. Festuca rubra L. var. glaucescens (Heget. & Heer) Richt. Rocky coast, Loch Eisg Brachaidh. (" ad var. *arenaria* vergens "; det. W. O. Howarth.)

828/1. Brachypodium sylvaticum (Huds.) R. & S. Rocks by coast road, Loch Eisg Brachaidh.

OBSERVATIONS ON VARIETIES OF VIOLA ODORATA L.

S. M. WALTERS.

Viola odorata L. exists in the wild state in Britain in a number of more or less clearly-defined varieties, the most generally recognised of which are the type, the var. *praecox* Greg., the colour-vars. *subcarnea* (Jord.) Parlatore and *dumetorum* (Jord.) Rouy & Foucaud, and the var. *imberbis* (Leighton) Henslow. It is with the last two that I wish chiefly to deal in this paper, which makes no pretence to be more than the results of preliminary observation and collection over two seasons only.

In N. Somerset, where the abundance of *V. odorata* forms is so striking and where most of my study has taken place, the commonest variety is undoubtedly the white-flowered var. *imberbis* Leight., a plant which Gregory preferred to call var. *dumetorum* forma *imberbis* (see below). Leighton's original descriptions of this plant as *Viola imberbis* (1835: in Loudon's *Mag. of Nat. Hist.*, 8, p. 277) or *V. odorata* var. *imberbis* (1835: *Flora of Shropshire*, pp. 115-6 and 514), leave no doubt that he realised that the character of beardless lateral petals from which he derived the name is only one of several characters distinguishing this plant from var. *alba* auct. plur. non Besser (i.e., var. *dumetorum* (Jord.) R. & F.). He did not, however, give an adequate comparative description of the two, and few botanists in the succeeding century have considered *imberbis* a good variety, preferring to accord it the status of forma and applying it to all beardless colour-varieties of *odorata*. Thus Gregory, on a specimen of Roper's in Herb. Univ. Cantab. labelled var. *imberbis*, wrote "Yes, forma *imberbis*; I think this scarcely deserves varietal rank"; and P. M. Hall wrote (1914: quoted by Gregory on a specimen in Herb. White, Bristol): "In March and April of this year I paid particular attention to forma *imberbis* Leighton. I found that each var. of *V. odorata*—i.e., type, *praecox*, *subcarnea* and *dumetorum*—has a corresponding '*imberbis*' form." More recently, Hall (1939: in Martin & Fraser, *Flora of Devon*, p. 124) recorded var. *dumetorum* and its forma *imberbis*.

A study of white-flowered *odorata* has convinced me that the two types are perfectly distinct, differing in a number of obvious characters and worthy of equal varietal rank. Moreover, both differ constantly in habit, hairiness, leaf-shapes, etc., from the violet-flowered type or types, though a further study of the coloured forms will be necessary before worthwhile conclusions can be drawn.

Rouy and Foucaud's descriptions of var. *dumetorum* and var. *subcarnea* (1896: *Flore de France*, *3*, p. 25) are interesting in that, neglecting the flower-colour difference, the descriptions would fit well British material of var. *dumetorum* and var. *imberbis*. Thus, for var. *dumetorum*, Rouy and Foucaud give: "pédoncules fortement hispides, sépales étroitement oblongs, éperon d'un violet pâle, capsules subglobuleuses," and for *subcarnea*: "tiges latérales allongées, la plupart radicantes; pédoncules glabres ou glabrescentes, pétales largement ovales-arrondies, capsules . . . . plutôt ovoides."

Observations by Gregory (*British Violets*, p. 7): "Mr Hunnybun and I have noticed a more rounded appearance in the flower of this form" (i.e., *imberbis*), and by Moss (quoted by White; 1912: *Flora of Bristol*, p. 171): " The large white violet of parts of Somerset seems to differ from the smaller white one of Cambridgeshire," reveal the fact that the distinctness of the two types had been casually noticed by these authorities, although no one apparently pursued the investigation further.

I have seen live material and herbarium specimens of var. *dumetorum* from a number of different localities during 1943 and the spring of 1944. and in none of these cases was there any outstanding departure from type although, as might be expected, size of plant and flower vary and may prove to be at least in part hereditarily determined (cf., size characters in *Viola Riviniana*, ... in which connection see Valentine; 1941: " Variation in *Viola Riviniana*," *New Phyt.*, *60*, 3). Thus var. *dumetorum* from upland limestone in N. Yorks is smaller in all its parts than specimens from Cambridge or N. Devon. Specimens of var. *imberbis* from a number of different sources in the South prove to be quite remarkably uniform. In N. Somerset, intermediates, presumably of hybrid origin, have been found where the ranges of the two varieties meet; a description of such a plant is given later.

A comparative description of the two varieties will reveal the more obvious characters which can be used to distinguish them:—

	Var. *dumetorum* (Jord.) R. & F.	Var. *imberbis* (Leight.) Henslow.
1. *Habit.*	Well-grown plant usually has distinct central stock with rather leafy stolons, rooting at the nodes and often producing in spring open flowers in the leaf-axils before rooting	Stolons are usually more vigorous and bear fewer leaves along their length, forming a distinct "rosette" plant readily rooting at the end. Flowers on young unrooted stolons rare.
2. *Leaf-shape.*	Leaves, especially summer leaves, rather pointed and triangular in outline, with widely-open sinus. Stipules lanceolate-acuminate.	Leaves rounded in outline, with a more closed sinus. Stipules broader and rather blunt.
3. *Hairiness.*	Whole plant strongly hairy, particularly obvious on peduncles, petioles and young leaves.	Plant much less hairy; young leaves often rather shiny and with an almost glabrous upper surface. Peduncles more or less glabrous.
4. *Flower.*	Petals white, with a variable quantity of violet suffusion on the outer surface. Spur violet. Lateral petals bearded. Sepals rather narrow and acuminate, with small "pinched-up" appendages.	Petals white, with a variable amount of reddish-purple suffusion on back. Spur deep red-purple. All petals tend to be broader than in *dumetorum*. Laterals quite beardless. Sepals broader and blunter (cf., stipules) with large conspicuous appendages.

5. *Fruit and Seed.* (Information incomplete.) Capsule more or less spherical.	5. Probably capsule more oval in shape. The larger sepal-appendages (which persist in both varieties) further distinguish it.

Information from local Floras concerning the distribution of the two varieties is on the whole rather scanty and unreliable, due partly to the prevalent treatment of *imberbis* as a mere forma, unworthy of careful record, and occurring in all colour-varieties. Such as there is, however, coupled with personal observation, makes it clear that var. *imberbis* is the commonest *odorata* variety over the southern chalk and limestone. On the Oolite of the Cotswolds in S. Gloucestershire, and the Oolite and Carboniferous Limestone of N. Somerset, var. *dumetorum* seems to be completely absent, and *imberbis* is the abundant white violet of the hedgerows. I have little doubt that *dumetorum* will prove to be absent similarly from the upland Hants. and Wilts. chalk. On the other hand, *imberbis* has not to my knowledge been recorded in the North at all (though its northern limit is as yet unknown to me) and is apparently absent and its place taken by var. *dumetorum* on the non-limestone soils of S. Somerset and N. Devon (e.g., Wellington, Minehead, Bridgwater), on the lowland coastal alluvium of Somerset (recorded from several localities between Burnham and Clevedon), and north of Bristol on the Gloucester road. Each type clearly has definite climatic and edaphic requirements, and appears to overlap the other very little in its range. The distribution of var. *dumetorum*, which appears to be confined to limestone in the North whilst becoming progressively more tolerant of non-basic soils towards the south-west, is paralleled by a number of other species (e.g., *Primula vulgaris* Huds., *Alchemilla pseudominor* Wilmott); the completeness with which var. *imberbis* replaces it on south-west limestone is, however, quite remarkable. (See Appendix for complete list of personal and other records of distribution.)

The intermediate plants mentioned above were among material collected in March 1944 at Compton Bishop and near Uphill, in N. Somerset; in both these localities var. *imberbis* is abundant on the limestone hill, whilst var. *dumetorum* occurs on the alluvial soils below. A description of one of these intermediates, from a hedgerow, Compton Bishop, follows: —

Habit of *imberbis*, with long stolon and distinct rooted plant at end. Leaf-shape of *imberbis*, particularly in closed sinus. Hairiness of *dumetorum*. Flowers have bearded laterals and violet colour of *dumetorum*; the colour is rather pronounced as a suffusion and shows, particularly in the bud, a reddish tinge. Sepals of *imberbis* rather than *dumetorum* (broad and blunt, appendages quite large).

The Uphill plant had the spur-colour and flower-bearing stolon character of *dumetorum*, with the beardless laterals, leaf-shape and slight hairiness of *imberbis*. One might hazard the guess that it was the occurrence of such intermediates in the vicinity of her Weston home which prevented Mrs Gregory from realising the distinctness of the two varieties. Her description of var. *dumetorum* in *British Violets* is sufficiently vague to cover both types, though that of Rouy and Foucaud could hardly be stretched to fit *imberbis*.

The frequent "×*Viola permixta*" of N. Somerset, which there is good evidence to believe is the F.1. hybrid of *V. odorata* and *hirta*, occurs most commonly in situations such as the edge of open limestone woodland where a population of var. *imberbis* meets a *V. hirta* population (see, in this connection, Snow & Chattaway; 1930: "Artificial Cross between *Viola hirta* and *V. odorata*"; *J. of B.*, *68*, pp. 115-6). A similar "×*V. permixta*" with putative var. *dumetorum* parent has been collected near Long Stowe in Cambridgeshire, and differs, as might be expected, from the N. Somerset plants in having a hairier and more triangular leaf.

Other white-flowered *odorata* plants occur which cannot be referred to either of the two types or their putative hybrid, but of which more observation and study are required. One of these is a plant closely resembling var. *imberbis* in everything except a much deeper almost *dumetorum*-like spur-colour, a colour present also as a large but very variably-developed suffusion of the white petals. This plant may be the var. *variegata* DC. (P. M. Hall; 1939: in Martin & Fraser, *Flora of Devon*, p. 125). Three plants of this type have been collected in the vicinity of Winford, N. Som. The complete absence of var. *dumetorum* from the immediate neighbourhood, as also the fact that in no other character does the plant resemble *dumetorum*, make it unlikely to be a *dumetorum* hybrid. The fertility of *odorata-hirta* and intraspecific *odorata* crosses would be expected to yield a bewildering variety of forms, and this plant may well turn out to be a hybrid product in which var. *imberbis* figures as one parent. Another white-flowered plant resembles var. *dumetorum*, but differs considerably in habit and general appearance. It is as yet only known in one locality (near Wrington, N. Som.), where it is growing with typical var. *imberbis*, a *V. hirta* var., and the hybrid "*permixta*." A plant of this kind might possibly result from a back-cross of "*permixta*" with *imberbis*. A description of a white-flowered "×*V. sepincola*" in Gregory's *British Violets* seems to fit the plant quite well. The hybrid nature of the plant is substantiated by its inability under cultivation (July 1944) to produce more than a couple of malformed capsules from cleistogamous flowers.

The status of the other varieties of *Viola odorata* might briefly be considered in connection with the white-flowered ones. In N. Somerset the frequent var. *subcarnea* Parl. appears to be a constant colour-variety of *imberbis* (i.e., it is identical with var. *imberbis* in everything except flower-colour, which is usually the same as that of the spur of *imberbis*) and occurs within the *imberbis* range, growing, for example, side by side with *imberbis* in hedgerows on Potter's Hill and on the S. slopes of Dundry Hill above Winford and the River Chew, N. Somerset. As mentioned above, Rouy and Foucaud's description of var. *subcarnea*, though omitting the bearded or beardless character, would apply in all characters except flower-colour to var. *imberbis*. There are other pink or lilac-flowered plants, some partly or fully bearded, which do not seem to have the clear varietal status of the N. Somerset *subcarnea*; it is probable that some of these are hybrids of the white vars. with the typical ("violet"-flowered) plant. This is almost certainly true of a plant growing with *imberbis*, *subcarnea* and the typical plant in a hedgerow near Winford, N. Somerset, in which, although the flowers are pink, there is no possibility of confusion with the true *subcarnea* nearby. Thus the whole flower is narrower (thinner petals, characteristic of the type), the laterals are distinctly bearded, and the pink colour of the flower is rather streaky and variable in intensity. In leaf, too, this putative "*imberbis* × typical" hybrid shows intermediate characters. A similar intermediate, of a streaky pale lilac-flower colour, was found growing with *dumetorum* and typical plant in the Long Stowe (Cambs.) locality previously mentioned. Such hypotheses can, of course, only be verified by artificial cross-pollination and production of the hybrid from the presumed parents. From the records of County Floras it seems probable that *subcarnea* forms are more or less confined to the *imberbis* range (i.e., southern chalk and limestone); although I have seen specimens of var. *subcarnea* apparently identical with the N. Somerset plant, but collected with var. *dumetorum* at Minehead, S. Somerset.

The "violet"-flowered typical plant, which occurs apparently throughout the range of the species in the country, is generally far less abundant than *imberbis* over the range of the latter, though towards the east and north it appears to become more common with respect to *dumetorum*. Like *dumetorum*, it seems to be fairly constant, though probably varying in size and hairiness over its range; but a much fuller study is required before a full description can be made. A N. Somerset plant which grows in quantity with var. *imberbis*, e.g., at Hartcliff Rocks Wood, near Winford, is characterised by a rather narrow flower, with thin petals and laterals strongly bearded, leaves smaller and more pointed (though not approximating to a triangular outline as in var. *dumetorum*), and in whole habit neater and less vigorous than var. *imberbis*. It is also quite markedly earlier in flower; flowers were just opening at a W. Harptree (N. Somerset) locality 27/2/44, and in the Winford locality 3/3/44, when *imberbis* plants growing close by were not in full bud. This early flowering is also shown by a beardless violet-flowered plant growing with *imberbis* near Plaster's Green, N. Somerset (in flower 25/2/43 and 11/3/44, when *imberbis* was still in bud). Although this beardless type is less frequent in N. Somerset than the bearded one described above, and also in Cambridgeshire and Bedfordshire, from which I have only seen the latter, Purchas recorded (1889: in Purchas and Ley, *Flora of Herefordshire*, p. 33) that in Herefordshire " the blue-flowered plant seems as frequently to have beardless flowers as the white." In part the form described above answers to the description given by Gregory of her var. *praecox* (*British Violets*, p. 2) and specimens in Herb. White passed by Gregory as var. *praecox* support this.

It is hoped that in future seasons further evidence may be gained from observation, cultivation and crossing of varieties of *Viola odorata* so that a fuller account of the species in Britain may be compiled. In the meantime I feel that these notes may be of some value to any other students of the species.

DISTRIBUTION RECORDS.

(A)—Personal observation and collection.
(B)—Herbarium specimens personally verified.
(C)—Reliable records in County Floras, herbaria, etc.

I. *Viola odorata* var. *dumetorum* (Jord.) R. & F.

4, N. Devon; hedgerow near Cullompton, 1943, (A): near Wellington, on Somerset boundary, 1944, (A).
5, S. Som.; Minehead, 1943 and 1944, (A): Nether Stowey, near Bridgwater, 1944, (A).
6, N. Som.; frequent in coastal lowlands; specimens from:—Berrow, Loxton, Compton Bishop, Weston, Cleeve, Clevedon, 1944, (A).
17, Surrey; Shere (in *Herb. Univ. Cantab.*), (B).
20, Herts.; Hitchin (in *Herb. Univ. Cantab.*), (B).
27, E. Norf.; near Thetford, 1944, (A).
28, W. Norf.; roadside near Castle Acre, 1944, (A).
29, Cambs.; from several localities, e.g. Long Stowe, abundant, 1944, (A), (also in *Herb. Univ. Cantab.*, (B)).
30, Beds.; several localities, 1943 and 1944, (A).
34, W. Glos.; Clifton side of Avon Gorge, Bristol; small patch in *imberbis* area, 1943, (A): side of Bristol road, c. 5 miles S. of Gloucester, with *imberbis*, 1944, (A).
40, Salop.; vicinity of Shrewsbury, Leighton, 1835 (*Herb. Univ. Cantab.*), (B): also Leighton; 1835: *Flora of Shropshire*, pp. 115-6, (C).
62, N.E. Yorks.; oolite S.E. of Middlesbrough, 1944, (A): near Thirsk, 1944, (A).

II. *Viola odorata* var. *imberbis* (Leighton) Henslow.

3, S. Devon; Torquay, and several localities near Plymouth: Hall in Martin & Fraser (1939: *Flora of Devon*, p. 124), (C).
4, N. Devon; Ilfracombe; Hall in Martin & Fraser (1939: *Flora of Devon*, p. 124), (C).
6, N. Som.; abundant on limestone and basic lias soils, (A).
7, N. Wilts.; near Somerset border east of Bath, 1944, (A): near Salisbury, abundant, 1944, (A).
11, S. Hants.: open chalk woodland S.E. of Winchester, abundant, 1944, (A): near Wickham (? garden escape), 1944, (A).
12, N. Hants.; Odiham: Herb. C. E. Palmer, (C).
13, W. Suss., and 14, E. Suss.; records by Hall (1937: in Wolley-Dod, *Flora of Sussex*, p. 53), (C).
17, Surrey; several records in Salmon (1931: *Flora of Surrey*, p. 156), (C).
22, Berks.; several records in Druce (1897: *Flora of Berks.*, p. 53), (C).
23, Oxon.; Druce (Gregory; 1912: *British Violets*, p. 8), (C).
24, Bucks.; Druce (Gregory; 1912: *British Violets*, p. 8), (C).
29, Cambs.; chalky railway embankment near Devil's Dyke, Newmarket, 1944, (A).
32, Northants.; Druce (Gregory: 1912: *British Violets*, p. 8), (C).
34, W. Glos.; Cotswold oolite north-east of Bristol, 1944, (A): abundant in Bristol district, (A).
35, Monm.; Wye Valley near Chepstow, 1943, (A).
36, Heref.; "occurs at various places round Ross," Purchas and Ley (1889: *Flora of Hereford*, p. 33), (C).
40, Salop.; vicinity of Shrewsbury (*Herb. Univ. Cantab.*), (B): see also Leighton (1835: *Flora of Shropshire*), (C).

FLORAL VARIATIONS IN STELLARIA HOLOSTEA L.

J. P. M. Brenan and J. Edward Lousley.

Stellaria Holostea L., the Greater Stitchwort, is one of our commonest and most widely distributed spring flowers. Variations in the conspicuous starry corollas might be expected to attract immediate attention and the comparative rarity with which they have been observed indicates the great constancy of the normal corolla of the species. When floral variations have been observed in this country in the past they have often been recorded with short and often inaccurate descriptions and this has obscured the fact that a number of quite distinct variants have been noticed which it is the purpose of this paper to bring to the notice of British botanists.

In the account which follows the more important variants are treated as varieties although both the writers would have preferred from the purely taxonomic point of view to have given them the status of forms. It seems, however, that they are likely to have a genetic basis in most cases, that they are unlikely to be ecological variants, and it is known that var. *laciniata* is not subject to a seasonal fluctuation. Moreover, an additional change of name would have been necessitated if it had been decided to regard them as forms and it is felt that with our present state of knowledge of matters deciding their true grade it is preferable to give them the higher rank for the time being and to leave future workers the opportunity of reducing them if necessary.

The species was described by Linnaeus in 1753 as " foliis lanceolatis serrulatis, petalis bifidis " (*Sp. Pl.*, 422) and it seems that in almost all cases where the petals are developed they are fundamentally ± bifid. There is a gathering by James Groves in Herb. Mus. Brit. and Herb. Univ. Cantab. collected from a thicket near Snaresbrook, S. Essex, 28th May 1881, which is a possible exception. The collector states on the label of the British Museum sheet that it is a " form with petals emarginate " and on that of the Cambridge sheet that it is a " var. with petals but slightly notched," and it seems from the dried material that the petals are almost entire. We have no other evidence that such a variation has occurred in Britain and it is not possible to be sure of its nature on the material available. Penzig (*Pflanzen-teratologie*, *1*, 303-4, 1890; ed. 2, 155, 1921) mentions a form with undivided petals on the authority of Wigand.

Under war-time conditions it is not practicable to inspect the Linnaean type and we have presumed that the typical plant has the corolla characters of the dominant British and European form, which has petals 8 to 12 mm. long, more or less symmetrically divided into two narrow (1.5 to 2.5 mm. wide) slightly divergent obtuse lobes separated by a sinus 4.5 to 5 mm. deep, the width of the petal at the junction of the lobes being 3 to 4 mm. We have also presumed that the sepals of the typical plant are entire and not serrulate above.

The following remarkable variations from the normal plant have been observed: —

A. PETALS LACINIATE

(i.e., divided into deep, narrow, irregular or regular segments).

b. var. *laciniata* Bromfield in *Phytologist*, *3*, 340, 1848; Bromfield (ed. Hooker & Salter), *Fl. Vectensis*, 69, 1856.

Petals equalling or shorter than the sepals, laciniate, of variable form, bilobed (sometimes with one of the lobes ± undeveloped), usually with a small tooth of varying shape at or near the base of the sinus; or ± deeply trilobed with the central segment linear-lanceolate; outer lobes usually with 1-3 ± coarse teeth on their inner margin. Sepals distinctly but rather irregularly serrulate on the upper part of their margins.

This has occurred in Britain as follows: —

10, I. of W.; Quarr Copse, Binstead, May 1838, Bromfield, *loc. cit.*

16, W. Kent; Hedgebank along the Postern Lane between Tonbridge and Devil's Bridge (in district 8 of Hanbury & Marshall's *Fl. Kent*), 1st May 1934 and 27th April 1936, J. P. M. Brenan (Hb. Brenan, Nos. 507 and 1700).

33, E. Glouc.; Birdlip Hill, 18th April 1920, J. W. Haines, comm. H. J. Riddelsdell (Hb. Druce, Hb. Univ. Cantab., Hb. Kew)—*B.E.C. 1920 Rep.*, 216, 1921, and *1927 Rep.*, 302, 1928.

35, Monmouth; Near Pont-y-Pool, 1842, James Bladon in *The Phytologist*, *1*, 264, 1842.

The important characters which distinguish this variety from the two variants to be described next are: —(1) the small size of the flowers, (2) the presence of a tooth between the two main lobes of the petals, and (3) the presence of serrulations on the sepals. The petals are at first shorter than the sepals, then accrescent and elongating, being finally slightly shorter, or subequalling but never exceeding them. This development is well shown in drawings of dissections of two flowers of Brenan's 1934 Tonbridge plant, where the petals of a flower with unripe anthers measured only 2.5-3.5 by 2-2.5 mm., while those of a mature flower measured 6-6.5 by 2.75-3.75 mm. The careful description given by Bladon (*loc. cit.*) describes the character of the sinus tooth very well indeed and there can be little doubt that Bromfield's specimens were very similar, as indeed he suggested. Sometimes this tooth is very small and occasionally it is almost large enough to be regarded as a third lobe, and the size may vary even in the petals of a single flower. Similarly there is great variation in the teeth on the outer lobes.

The presence of serrulations on the sepals does not appear to have been previously noticed in *Stellaria Holostea* but it seems to be constant in this variety. The serrulations are conspicuous enough under the lens, though the white mounting paper generally used does not provide a suitable background to render them obvious.

Riddelsdell, commenting on Haines' Birdlip plant in *B.E.C. 1920 Rep.*, 216, 1921, says " The sepals apparently have a rather stronger tendency to ciliation than the type, but the latter difference is slight." The cilia to which he refers are genuine cilia and not the serrulations we have referred to above, and they are strongly developed in the Birdlip plant. In Brenan's Tonbridge specimens cilia are fairly frequent on the margins in the median portions of the sepals. A few cilia are occasionally developed on the sepals of normal *S. Holostea* and our experience does not suggest that they are likely to be a constant feature of var. *laciniata* though there would appear to be a tendency for their greater development in this variety.

Although the descriptions are inadequate the following continental references may apply to a similar plant:

Var. *laciniata* Rostrup in *Bot. Tidsskr.*, *10*, 250, 1879; Asch. & Gr., *Fl. Nordostd. Flachl.*, 310, 1898; Murbeck in *Bot. Not.*, 203, 1899; Graebner in Asch. & Gr., *Syn. Mitteleur. Fl.*, *5*, i, 543, 1916; forma *laciniata* (Rostrup) Hegi, *Ill. Fl. Mittel-Eur.*, *3*, 355, 1912.

The only diagnostic character given by Rostrup is that the petals are deeply four-lobed and Murbeck and Hegi follow the original description. In the British plants we have cited as var. *laciniata* of Bromfield the two main lobes of the petals are sometimes coarsely toothed and it is conceivable that extreme examples might be described as four-lobed though this could not be said to be characteristic of the plant as known to us. Ascherson and Graebner characterise the variety as having very narrow tips to the petals and do not mention the division into four lobes. It remains doubtful whether any of these continental authors had in mind material similar to that which we have described from Britain, but in any case Rostrup's varietal name is a later homonym of Bromfield's and therefore invalid.

A further name to be considered if the variant is to be treated as a form arises out of a note by G. C. Druce in *Fl. Berks.*, 94, 1897, where he writes " A plant with laciniate petals was noticed between Arborfield and Finchampstead (*forma laciniata*)." There is no specimen so labelled in Herb. Druce and the description equally covers not only forma *Lousleyi*, which he described much later (see below) when he presumably regarded it as a different plant, but also the new variety we describe below. Druce's name must therefore fail through uncertainty of application.

James Bladon states that 8 or 10 "rather large bushes" of var. *laciniata* occurred near Pont-y-Pool and that he intended to try to grow the variation from seed, but unfortunately there is no record of the result of any such experiment. Bromfield found "a good many specimens." Brenan collected the variety from the same spot near Tonbridge in 1934 and again in 1936. It is thus evident that it is not a seasonal variation and the remarks of the two earlier finders suggest that it may perhaps be transmitted by seed.

c. var. *Lousleyi* (Druce in *B.E.C. 1927 Rep.*, 302, 1928, as forma) Brenan & Lousley, *comb. nov.*

Petals exceeding the calyx, equalling or exceeding those of typical *S. Holostea*, deeply bilobed, the lobes entire, narrower and acute, not rounded-obtuse at apex. Sepals entire, eciliate.

Type: 17, Surrey; Roadside near Woldingham, 1st May 1927, J. E. Lousley in Hb. Lousley.

Druce described the new form as follows: "Differs in its much narrower linear petals, 3 mm. wide as against 5 mm. in the type, the petals, too, are more deeply cleft and the segments acute, not obtuse as in the type. The peduncles are much more hairy." This description was based on notes supplied by the finder and no specimen is now to be found in Herb. Druce, although the relative correspondence and notes are mounted on a herbarium sheet. The last sentence in Druce's description is misleading—it happened that the specimens of normal *S. Holostea* collected at the same time as type var. *Lousleyi* had less pubescent peduncles but further experience shows that this is by no means generally so. Druce at first proposed to describe the new form as f. *Louslei* (*in litt.* to J. E. Lousley, 9th May 1927), but published the spelling we have given above.

The variety has occurred as follows:—

6, N. Somerset; Near Keynsham, Aug. (sic), 1941, Ivor Evans, Hb. C. Sandwith and recorded in *Proc. Bristol Nat. Soc., 4th series, 9*, 287, 1942, where a descriptive sentence was added which does not agree at all with the dried material. Mr N. Y. Sandwith informs us that these remarks referred to his Suffolk plant which is discussed by us under the next variety and not to the Keynsham plant which is alone mentioned in the note.

17, Surrey; Valley End, Chobham, June 1891, J. D. Hooker (Hb. Kew); Woldingham as above.

22, Berks.; A fairly large patch on a bank by a ditch on margin of a cultivated field between Hid's Brake and Saddle Copse near Cumnor, 30th April 1944, J. P. M. Brenan and R. Burn (Hb. Brenan, No. 6969).

24, Bucks.; Wycombe, May 1865, ex Herb. Eliz. Chandler (Hb. Mus. Brit.).

36, Hereford; Sellack, May 1873, A. Ley (Hb. Mus. Brit., Hb. Univ. Cantab.)—see Purchas & Ley, *Fl. Herefordsh.*, 45, 1889, where it is stated that this occurred "in 1872 and subsequent years."

44, Carmarthen; Ferryside, J. W. Haines, *B.E.C. 1927 Rep.*, 302, 1928. In Hb. Druce there are specimens of this gathering but they are so miserably prepared that determination is impossible—one of them may be only normal *S. Holostea* which was perhaps sent for comparison. Fortunately the letter from Haines pointing out the differences between the Ferryside and Birdlip (*vide supra*) plants is attached and we rely on this for citing the record.

The variety has thus been found in April, May, June and August, and has proved persistent in at least one station.

d. var. *schizopetala* Brenan et Lousley, *var. nov.*

A var. *laciniata* Bromf. sepalis integris petalis sepala manifesto excedentibus, a var. *Lousleyi* (Druce) Brenan et Lousley petalis latioribus inaequaliter laciniato-lobatis plane differt.

Planta pulchra, flores magnos gerens. Sepala integra, eciliata, 9-9.5 mm. longa. Petala 11-15 mm. longa, 6-7 mm. lata, in eodem flore conspicue heteromorpha, bilobata, lobis nunc fere ad eorum basim iterum fissis, laciniis lobi saepe inaequalibus, nunc apice ± breviter vel satis profunde bilobulatis, nunc etiam integris deinde lingulatis apice ± rotundatis (more *S. Holosteae* normalis nec var. *Lousleyi*). Aliter ut in *S. Holostea* normali.

This variety differs from var. *laciniata* by the entire sepals and by the petals manifestly exceeding the sepals; from var. *Lousleyi* by the wider and irregularly laciniate-lobate petals. It is a very beautiful plant with large flowers. Sepals entire, eciliate, 9-9.5 mm. long. Petals 11-15 mm. long, 6-7 mm. wide, conspicuously heteromorphic in one and the same flower, bilobed, with the lobes sometimes again cleft almost to their base into often unequal divisions, sometimes ± shortly or fairly deeply bilobulate at the apex, and sometimes even entire and then lingulate and ± rounded at the apex (as in normal *S. Holostea* but not var. *Lousleyi*). Otherwise as in normal *S. Holostea*.

Type specimen : 25, E. Suffolk; Blythburgh, by disused railway track, 10th May 1940, M. M. Whiting & N. Y. Sandwith—ut *S. Holostea* L., forma (Hb. Kew).

This very striking and handsome plant is very distinct from all the other material we have seen. The deep segmentation of the petals often results in them becoming irregularly and deeply four-cleft and they might thus be said to agree with Murbeck and Hegi's description of Rostrup's *laciniata*. If, however, they had actually had this remarkable plant in mind it is difficult to believe that they would have been content to give such a brief description confined to a single character. As stated above, Rostrup's varietal name is in any case invalid.

Nothing is known as to the persistence of the variety—a large clump was observed at the time of collection.

We have been unable to ascertain to which of the above varieties the plant with deeply laciniate petals found sparingly near Dulverton and recorded by R. P. Murray (*Fl. Somerset*, 51, 1896) belongs.

B. PETALS ABSENT OR VERY SMALL.

e. var. *apetala* [Rostrup in *Bot. Tidsskr.*, *14*, 118, 1884—*nomen nudum* —ex] Asch. & Gr., *Fl. Nordostd. Flachl.*, 310, 1898; Graebner in Asch. & Graebn., *Syn. Mitteleur. Fl.*, *5*, 1, 543, 1916: forma *apetala* [Rostrup] Murbeck in *Bot. Notiser*, 203, 1899; Hegi, *Ill. Fl. Mittel.-Eur.*, *3*, 355, 1912.

Petals completely absent, or very rarely a few of the anthers may be converted into contorted petaloid structures or extremely rarely an odd petal may be present.

Apetalous plants have been found as follows:—

6, N. Somerset; Roadside near Lancherley Cross, near Wells, 21st May 1883, R. P. Murray in *Fl. Somerset*, 51, 1896.

17, Surrey; Roadside south of Netherne House, near Farthing Downs, in Merstham parish, 28th May 1902, C. E. Britton (Hb. Mus. Brit., Hb. Kew.)—Salmon, *Fl. Surrey*, 184, 1931; Wisley, 16th May 1928, Turner (Hb. Sth. Ldn. Bot. Inst.).

36, Hereford.; Ewias Harold (=Ewyas Harold), 9th May 1848 (Hb. Benth. in Hb. Kew.).

37, Worcs.; Malvern Link, 11th May 1908, S. H. Bickham & R. F. Towndrow (Hb. Druce, Hb. Marshall in Hb. Univ. Cantab., Hb. Sth. Ldn. Bot. Inst.)—*Watson B.E.C., 1908-9 Rep.*, 177, 1909, and *B.E.C. 1908 Rep.*, 363, 1909.

48, Merioneth; " floribus constanter per multos annos apetalis," Aberdovey, Mr Pugh ex herb. T. Salwey & M. C. Cooke (Hb. Mus. Brit.).

This apetalous variant appears to be rare on the continent—it is given by Rostrup and Murbeck for Denmark, and Hegi gives it as rare, giving only near Godesberg on the Rhine as a locality.

Britton states on his labels that his plant grew over a space of " two or three yards," and that it proved fertile. From Pugh's note we know that the plant remains constant for a number of years.

Before leaving the named variants there is one further name which should be mentioned. F. Svanlund in a paper on the flora of the Swedish province of Blekinge described a var. *micropetala* from " Wämmö " as having the petals equalling the calyx or shorter (*Bot. Not.*, 1886, 6). Hegi (*Ill. Fl. Mittel-Eur.*, *3*, 355, 1912) reduces this to a form. There is a gathering from Sweden collected by Johan Erikson in June 1932 in Hb. Lousley. The locality is difficult to read but looks like " Blecingia: Vamó " and is very probably the one cited by Svanlund when he described his new variety. Some of the flowers agree with the description but the specimens seem to be of a starved plant and there is a tendency towards the production of abortive flowers.

The following variants have also been mentioned in British literature or are represented by herbarium material:—

A. *Fl. pleno.* The only double-flowered specimens we have seen are in *Herb. Hookerianum*, which is incorporated in the general collection at Kew, and are localised vaguely as " Sussex." We are not aware of the particular form taken by the " doubling," which is not clearly shown by the specimen.

B. *Lusus*, in which the flowers are almost all replaced by successive pairs or whorls of sepaloid organs, the lowest often separated by distinct internodes. This was distributed by T. R. Archer Briggs from:—

3, S. Devon.; Hedgebank on the Plymouth and Tavistock road near Fancy, 25th May 1871, 13th May 1873, and 30th May 1877, T. R. Archer Briggs (Hb. Mus. Brit., Hb. H. C. Watson in Hb. Kew, Hb. Druce, Hb. Univ. Cantab.)—*B.E.C. 1871 Rep.*, 13, 1872; Briggs, *Journ. Bot.*, *10*, 240, 1872; Briggs, *Fl. Plymouth*, 50, 1880; Keble Martin & Fraser, *Fl. Devon.*, 154, 1939.

A very similar plant has been found more recently:—

5, S. Somerset; Milverton, 1925 and 1927, W. Watson (Hb. Mus. Brit.) —*Proc. Linn. Soc.*, 139th session, 12th May 1927, p. 45, 1927.

C. A very curious plant described as " A var. with yellow petals, broader and half as long as the calyx; anthers very large and yellow. Side of the canal at Exeter," E. Parfitt in T. F. Ravenshaw, *Flow. Plants & Ferns . . . of Devon*, 12, 1860, and Keys, *Fl. Devon & Cornw.*, 37, 1866. We have no further information about this remarkable discovery, which is not mentioned in the recent *Fl. Devon.*

Finally, we wish to express our appreciation of the facilities which have been placed at our disposal by the custodians of the various herbaria cited, and to Mrs Sandwith and Mr N. Y. Sandwith for the loan of material and for useful notes.

SUMMARY.

We have presumed that typical *S. Holostea* is the common British and European plant with petals 8-12 mm. long, exceeding the sepals, and divided into two sub-equal narrow entire obtuse lobes, and sepals entire, eciliate or only sparsely ciliate and not serrulate above. From this we distinguish the following:—

A. *Varieties with laciniate petals.*
  b. var. *laciniata* Bromfield. Petals equalling or shorter than the sepals, with two outer coarsely toothed lobes with a tooth or third lobe at the base of the sinus between them. Sepals serrulate on their upper margins, usually (? always) ciliate.
  c. var. *Lousleyi* (Druce) Brenan & Lousley. Petals exceeding the sepals, divided into two narrow (c. 3 mm.) entire, acute lobes. Sepals entire, eciliate.
  d. var. *schizopetala* Brenan & Lousley. Petals much exceeding the sepals, longer and wider than in normal *S. Holostea* (11-15 × 6-7 mm.), deeply and very irregularly cleft, heteromorphic in each individual flower. Sepals entire, eciliate.

B. *Variety with petals absent. Sepals normal.*
  e. var. *apetala* [Rostrup ex] Asch. & Gr. Petals absent, but flowers fertile and otherwise normal.

In addition, the following variants are noticed:—

A. *Fl. pleno.*
B. *Lusus* with " foliaceous panicle " in which the flowers are replaced with pairs or whorls of sepaloid organs.
C. A variant with short yellow petals and very large yellow anthers.

THE DISTRIBUTION OF CRATAEGUS MONOGYNA JACQ. AND CRATAEGUS OXYACANTHOIDES THUILL. AND A STUDY OF THE MORPHOLOGY OF THE FRUITS.

Dr Stanislaw Batko.

I. PREVIOUS INVESTIGATIONS.

A. HISTORY OF NOMENCLATURE AND GENERAL REMARKS ON THE DISTRIBUTION OF C. MONOGYNA AND C. OXYACANTHOIDES.

The word *Crataegus* itself is of very old origin. It was applied by early botanists to various different plants. So in W. Smith's Latin-English Dictionary (London, 1860, p. 263) the following reference is given: " crataegon, onis, or crataegus, i, m = Κραταιγών, a plant called in pure Lat. aquifolia. Its identification is very uncertain. In Pliny it is referred to the Krataegon of Theophrastus, which seems to have been *Crataegus Azarolla* Griseb. or *Pyrus torminalis* Linn.: Plin., 27, 8, 40." Dodoens says (*Pempt.*, p. 758, cap. xx, De Agrifolio [about *Ilex*]): " Plinius autem lib. xxvii, cap. xxviii, Agrifolium interpretatur Κραταιγών." . . . The word *Oxyacantha* (*Oxyacanthus*) was used by ancient botanists, e.g., Galenus, Theophrastus, Dioskorides, Serapio to distinguish various spiny plants. The word *monogyna* is derived from μόνος = alone, single, γυνή = a woman, the female sex, and was applied to one-styled *Crataegus* by Jacquin. For the history of the English name Hawthorn see F. N. Williams (1916: 197, 198). During the Middle Ages *Crataegus Oxyacantha* L. was known in Poland under a number of different Latin and Polish names. An index of these has been compiled by Rostafinski (1900: 190).

In so far as Linnaeus' description in *Genera Plantarum* (1737: 143) is concerned, there is evidence in the Linnaean Herbarium and in the herbarium of the *Hortus Cliffortianus* that Linnaeus knew one-styled *C. curvisepala* Lindm. and *C. monogyna* Jacq. According to Mr Dandy, the satisfactory determination of the type of the name *C. Oxyacantha* L. (1753: 477) is impossible at the present time, but a statement on the present position by Mr Dandy follows this article. In the present paper the nomenclature well known in this country will be used, i.e., *C. oxyacanthoides* Thuill. (=" *C. Oxyacantha* L. em. Jacq.") for the two-styled plant, and *C. monogyna* Jacq. for the one-styled plant.

N. J. Jacquin (1775: 50) was the first to give satisfactory descriptions of *C. monogyna* and *C. oxyacanthoides* (his *C. Oxyacantha*). He says[1]: " The two shrubs, which are extremely distinct from one another in appearance, have been completely confused by botanists or have been separated so carelessly on different occasions that I thought it worth while to figure them on the same plate so that the difference might be more easily seen and established. Each of them grows in the country round Vienna; *C. monogyna* everywhere and in abundance, *C. Oxyacantha*, on the other hand, nowhere in the neighbourhood of the city. In *C. Oxyacantha* the leaves are somewhat villous on the mid-rib and the main dorsal nerves, and so for the most part are the peduncles and petioles, but these hairs are more easily seen under a lens than with the naked eye. They are obtuse, unequally serrate throughout the whole circumference, only in the upper part obsoletely three-lobed and with a few deep incisions. There are 2 styles, rarely 3, and in extremely few flowers I have seen 4. . . . The fruit contains 2, 3 or 4 stones, according with the number of styles in the flower; . . . On the other hand, in *C. monogyna* the leaves are quite glabrous and more shining; at the same time, most of them are very deeply cut into 5 or 3 acute lobes which are quite entire or, towards the apex, serrate with a few teeth. The peduncles are not villous. . . . There is constantly a single style rising from the centre of the ovary. I have never seen more than one in any flower; and thus the fruit also constantly bears only a single seed." . . . It is interesting to notice that in Jacquin's description peduncles of *C. Oxyacantha* are described as commonly villose, while those of *C. monogyna* are glabrous. This description of peduncles differs from the English descriptions of the peduncles of the two species.

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[1] This is a translation of Jacquin's Latin.

C. monogyna, according to Hegi, belongs to the euro-sibiric element of the Eurasian Flora, being more adaptable to various habitats than *C. oxyacanthoides*. It extends much further to the south, to the north and to the east, and also ascends to higher altitudes than the latter species. Northwards it extends to Great Britain, Norway (as far as Nordmöre), Sweden (to Gestrikland and Wermland), Åland, Åbo, Ingermanland, eastwards to Central Russia, Kasan, Orenburg, from the Caucasus to Armenia, Himalaya, Syria, North Africa (Hegi, 1923: 736).

It should be emphasised that according to the new treatment of *Crataegus* by Pojarkova (1939: 455→ in the U.S.S.R. Flora) the Eastern area of true *C. monogyna* is rather small. It is restricted to European Russia (Upper Dnieper district, Czernichów district, Middle Dnieper district, Southern Don, Upper Crimea, some part of the Caucasus). The south-eastern boundary of *C. monogyna* is not so clear. There are in Herb. Kew specimens of *C. monogyna* from Syria, Asiatic Turkey, Iran and Afghanistan. A special reference to the Russian and to the Indian specimens of *Crataegus* at Kew will be given later.

The general distribution of *C. monogyna*, according to Tansley (1939: 260), agrees with that given by Hegi.

C. oxyacanthoides Thuill. [" *C. oxyacantha* L. em. Jacq."] was regarded by Hegi as a european species with distinctly marked sub-Atlantic character. It differs in its distribution from *C. monogyna*, being restricted to suboceanic regions with a local climate characterised by relatively slight temperature range and corresponding humidity of the air.

General distribution, according to Hegi (1923: 733):—Europe; northwards to Great Britain, in Norway introduced but not indigenous, South and Central Sweden, Courland; it has been recorded from South Finland.

The general distribution, according to Pojarkova (1939: 437), comprises the whole of Central Europe, extending eastwards to the Baltic Sea countries, Poland and Southern Scandinavia. The significance of this distribution will be discussed below. The species grows in the Balkan Peninsula (Halácsy, 1901: 546; Beck, 1927: 169), as well as in Roumania (Prodan, 1923: 555). Szafer (1923: 242) is of the opinion that all records of *C. oxyacanthoides* in Courland and S. Finland require re-examination.

More recently a report has been published by Stares (1925: 232) on the distribution in Latvia (Courland). This species is rare in Latvia. An attempt has been made to confirm Hegi's reference to its occurrence in Southern Finland. The record (Lindberg, 1906: 9) is as follows: "Af Crataegus Oxyacantha L. förvaras i finska samlingen endast en liten Kvist från en odlad buske i Brunnsparken, Helsingfors (24, 7. 1877, leg. Th. Saelan). Bestämningen godkänd of Lector Lindman." This may be rendered: "Only a small sample from one shrub cultivated in Brunnsparken, Helsingfors." This merely confirms Szafer's doubts about its occurrence in Finland. The distribution in Esthonia has been given by F. J. Wiedeman and E. Weber (1852: 260): "C. Oxyacantha L. . . . In E.: Surrup (Törmer), Walküll! Ebbafer'scher Berg.! . . ." while localities for Lithuania have been recorded by B. Hryniewiecki (1933: 214). The Lithuanian localities are a very important link between those of Latvia and Poland. Szafer (1923: 241) agrees with Wierdak (1920)[2] that *C. oxyacanthoides* extends eastwards as far as Poland. The opinion of both Polish scientists is supported by Pojarkova (1939: 437).

Batko (1933) worked up the distribution of *C. oxyacanthoides* in the district of Przemysl and Dobromil. It extends nearly to the town of Jaroslaw (Kidalowice Forest, I saw it, July 1939) in the Roztocze Hills (near to the villages of Mokrotyn, Batko, 1935) and Glińsko (I saw it, July 1939). The author has also seen at Roztocze both *C. curvisepala* Lindm. and *C. monogyna*. The stations of *C. oxyacanthoides* in Roztocze represent one of the most eastern extensions of its range. The details of the distribution of *C. oxyacanthoides* in Poland are still insufficiently known, while those of the U.S.S.R. Flora were recorded in 1939. From the U.S.S.R. Flora (Pojarkova, 1939: 437) we may conclude that *C. oxyacanthoides* has at present no authentic records from European Russia, the Crimea and the Caucasus, but there has been confusion here with other 2-3-stoned species from the groups *Ambiguae* and *Erianthae* and hybrids of *C. pentagyna* and *C. kyrtostyla* (usually from the European part of Russia)

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[2] More recently new stations in Sandomierski Lowland and on the south-eastern edge of Malopolski Plateau were reported by Wierdak (1925).

This point of view, that *C. oxyacanthoides* only reaches as far East as Poland and the Baltic countries, is quite new. The south-eastern boundary of *C. oxyacanthoides* is less clear. It was recorded from India by J. D. Hooker (1879: 383) but the description of the leaves does not fit. None of the Kew specimens I have seen (1944) from the Orient (including India) labelled "*Crataegus oxyacantha*" is *C. oxyacanthoides*. It is hoped to give some further information about these specimens later. The only recent note concerned with the distribution of "*C. oxyacanthoides*" in Asia I have seen is by Bouloumoy (1930: 118): "*Crataegus Oxyacantha* L. . . . Vallées du Liban et de Antiliban et intér., Damas." Schneider (1906: 781) expressed the view that the occurrence of *C. oxyacanthoides* in Asia is very doubtful. If it grows there at all, it appears to be rare.

We can now understand why the general distribution of *C. oxyacanthoides* has often been reported insufficiently or even wrongly (e.g., Ascherson & Graebner, 1906; Hegi, 1923; Druce, 1932; Stoïanoff & Stefanoff, 1925; etc.).

THE DISTRIBUTION OF C. MONOGYNA AND C. OXYACANTHOIDES IN THE BRITISH ISLES.

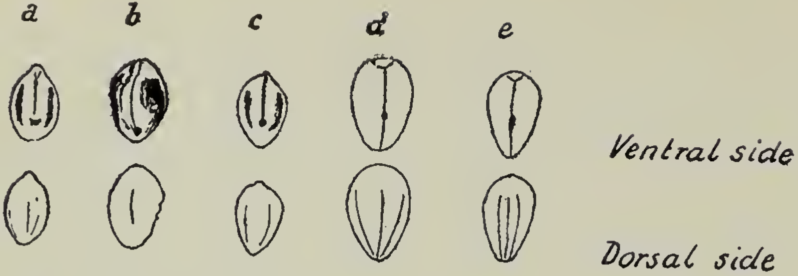
The distribution of Hawthorn has been summed up by Druce in the *Comital Flora* (1932: 112):

1—*C. monogyna* Jacq. Septal. British. Thickets, woods, hedges. Common and generally distributed. Small tree. Lowland to 1800 ft. in Yorks; 1700 ft. in Carnarvon; 1600 ft. in Tipperary. Very variable and hybridises with 2. . . . 112. H.40. S. Throughout the British Isles, but perhaps planted in 111 and 112.

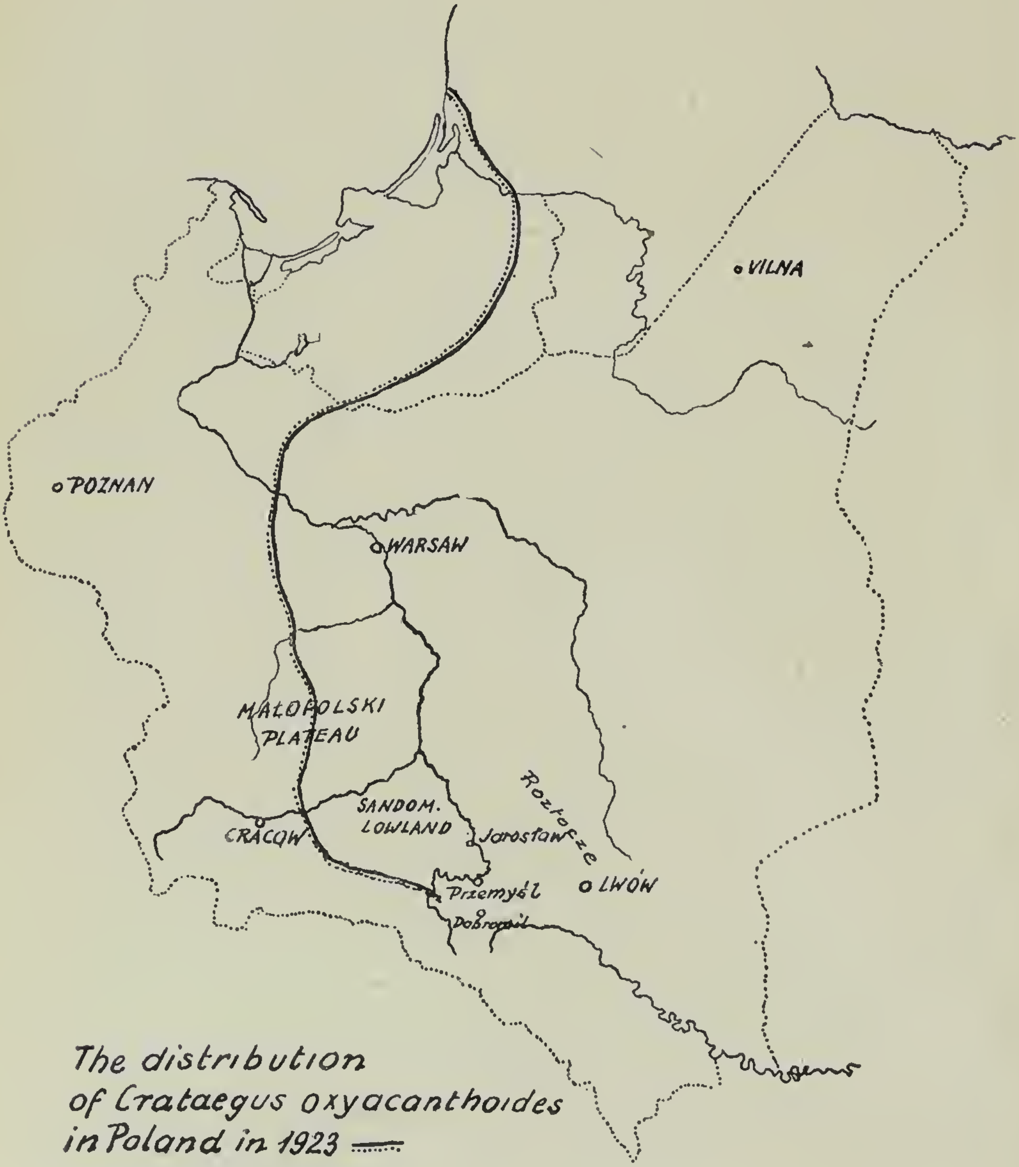
2—*C. oxyacanthoides* Thuill. Septal. English. Hedges, chases, woodlands. Usually in damper places than *monogyna*, and more local. Small tree. Lowland. Variable. . . . 32. H?.

To the vice-counties there given the following should be added: 11 and 12 (*B.E.C. 1933 Rep.*, 561), 13 (Wolley-Dod 1937: *Flora of Sussex*, 176-7), 14 (*J.B.*, 1909, 24), 36 (*B.E.C. 1941-2 Rep.*, 488, 535), 41 (*B.E.C. 1933 Rep.*, 705), 44 (*B.E.C. 1912 Rep.*, 211), 50 (*J.B.* 1911 *Suppl.*, 21), 56 (*J.B.*, 1909, 136), 59 (*B.E.C. 1918 Rep.*, 379), 70 (*B.E.C. 1914 Rep.*, 143), 94 (*J.B.*, 1904, 17) [3 (Martin & Fraser 1939: *Fl. of Devon*), 96 (*J.B.*, 1904, 17)].

The distribution in Ireland has been recorded by R. L. Praeger (1934: 508). A very interesting report on the northern outpost of *C. oxyacanthoides* in the Outer Hebrides has been given by J. W. Heslop Harrison et al. (1939: 2)—"**Crataegus Oxyacantha* L. Almost certainly native on cliffs on the northern shores of Loch Boisdale." This identification has been confirmed by Prof. Harrison in a letter kindly sent to me. I myself saw *C. oxyacanthoides* in scrub near Killearn, West Stirlingshire, Scotland, either indigenous or introduced. *C. oxyacanthoides* had been reported many years ago by Stirling and Kid-


a
b
c
d
e
Ventral side
Dorsal side

The structure of the stones of Crataegus:
a. monogyna, b. oxyacantha, c. curvisepala
d. calycina, e. microphylla


VILNA
POZNAN
WARSAW
MAŁOPOLSKI PLATEAU
SANDOM. LOWLAND
CRACOW
Roztocze
Jarosław
Przemyśl
LWÓW
Dobromil

The distribution
of Crataegus oxyacanthoides
in Poland in 1923 ═══
according to Szafer
adapted by S. Batko

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ston (1891: 10)—" 534a. *Crataegus Oxyacantha* L. var. *oxyacanthoides* Thuill. Distr. No. 3×." But the indigeneity of that species was not discussed there.

In Tansley's standard work, *The British Islands and their Vegetation* (1939: 260), we find general notices on the distribution of Hawthorns. From this book we conclude that *C. oxyacanthoides* is nearly confined in England to the south-east, where it is quite local, while *C. monogyna* is by far the most abundant and widespread species of Hawthorn in Great Britain. *C. monogyna* is very rare in the north of Scotland, and there is much less of it even in southern Scotland than in England. Generally speaking, *C. oxyacanthoides* is rarer (even within its area of distribution) than *C. monogyna*.

I must add that it is difficult to assess accurately the distribution of Hawthorns in the British Isles because they are commonly planted as components of hedges.

THE DISTRIBUTION OF HAWTHORNS IN POLAND.

It is difficult to give an account of the distribution of *C. monogyna* and *C. oxyacanthoides* in Poland by references to the older Polish records and descriptions, because at that time the species were not properly distinguished. Since about 1920 much attention has been devoted to Hawthorns in Poland. Lindman's classification (1918) was widely adopted there. *C. monogyna* has been further split by Lindman into[3]:

1. *C. monogyna* Jacq. (sensu stricto). Leaves more or less cut, with more or less acute lobes, the margin usually entire or only with a few teeth at the tip of the lobes, with domatia in the axils of veins and, often, long petioles. Calyx with sepals 1-2 times as long as broad, usually obtuse and adpressed. Fruit (av. size: 9 mm. long, 7 mm. broad) with a stone having on the ventral side two longitudinal shallow furrows with blunt borders.[4] This occurs commonly in the Polish Lowlands, rarely in the mountains.

2. *C. curvisepala* Lindm. Leaves distinctly serrate with narrower and acute lobes. Fruit large (av. 15 mm. by 10 mm.). Fruit with one stone. Stone large (9 mm. by 6 mm.) with furrows on the ventral side similar to those of *C. monogyna*, but with distinctly marked intervening ridge, longitudinally ribbed on the dorsal side. The ventral furrows of the stones are sometimes very shallow[5] and then the stone resembles

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[3] The following descriptions are according to Lindman, but adapted by Szafer, W. (1923).

[4] The stones of specimens collected by me in this country sometimes have slightly marked furrows.

[5] I have myself only to confirm Szafer's descriptions. I examined at Kew two stones of *C. curvisepala* from Switzerland (Gebüsch an der Wiese in den Langen Erlen; coll. 19.9.1931 by Paul Aellen). On the ventral side they bear two longitudinal furrows (like those of *C. monogyna*), while two examined stones of *C. curvisepala* from Sweden (Uppland: Stockholm, Experimentalfältet; coll. 15.9.1927, by Erik Asplund) are almost smooth (without furrows) on the ventral side.

that of *C. calycina.* Sepals acute, several times as long as broad, adpressed or ascending. *C. curvisepala* seems to take the place of *C. monogyna* in the lower regions of the Carpathians, being rare in the Polish Lowlands.

3. *C. calycina* Peterm. em. Lindm. Leaves similar to those of *C. curvisepala* but bright green with thin blades. Fruit cylindric (up to 15 mm. long and 10 mm. broad) with sepals erect and connivent. Fruit with one stone about 8 mm. by 4.5 mm. on the ventral side smooth (without furrows), longitudinally ribbed on the dorsal side.[6] Common throughout the Polish Lowlands and in the lower regions of the Carpathians.

4. *C. lagenaria* Fisch. et Mey. Leaves with short crenate lobes. Calyx short, loosely erect with curved sepals. Fruit with one stone. Stones (according to Schneider) without distinct furrows. I examined two specimens of "*C. microphylla* Koch." (=*C. lagenaria* Fisch. et Mey.) in Herb. Kew. The first was collected in Azerbaidzhan (U.S.S.R.) "In sylvis ad pagum Rva distr. Lenkoran (Talysh. S.L.), 10.v.1915, leg. N. Pastuchov." The two stones had slight longitudinal ribs on the dorsal side, and on the ventral side the first was entirely smooth, the second almost so. The second specimen was collected by Cowan and Darlington in N. Persia, Ghazagheli, Aotara Pass, 15.vi.29. One stone was smooth on both sides. General distribution: Sweden (according to Lindman), European part of Russia, Crimea, Caucasus, Balkan Peninsula, Turkey (Lazistan), Iran (Pojarkova, 1939: 461). The distribution in Poland (according to Szafer) is still uncertain.

The group including *C. oxyacanthoides* Thuill. has been divided by Lindman into two species:

1. *C. oxyacanthoides* Thuill. (his *C. oxyacantha* L. em. Jacq. sensu stricto). Shrub 2-4 m. high. Leaves without domatia, glossy, 2.5-4 cm. long. Fruit 7-12 mm. long. Sepals as long as broad, adpressed. Fruit with two stones (rarely less or more). Stone on the ventral side with two longitudinal deep furrows bordered with sharp ridges.

2. *C. Palmstruchii* Lindm. Usually taller. Leaves larger, 3-5 (-7) cm. long, with domatia. Fruits larger 10-12 (-15) mm. long. Sepals twice as long as broad, spreading-ascending. Stones (according to my observations) larger than those of *C. oxyacanthoides* with the same structure as those of the preceding species. Grows in Sweden equally well wild or cultivated (according to Lindman). It was recorded from Poland (S. Batko, 1935B), from Esthonia (Lippmaa, 1935), and from Denmark (Raunkiaer, C., 1934), there with hairy ovaries. The writer's specimen from Ruislip has glabrous calyx-tubes.

It should be emphasised that Lindman's species have been successfully identified not only in Poland but in Czecho-Slovakia (Domin & Podpera,

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[6] The structure of the stones of *C. calycina* seems similar to that of *C. microphylla* Koch and *C. pinnatiloba* Lange (Schneider, 1906: 785-86). *C. calycina* was even allocated to the group 7. *Microphyllae* A. Pojarkova (1939: 458).

1928: 315), Denmark (Raunkiaer, 1934), Latvia (Starcs, 1925: 226), Esthonia (e.g., Lippmaa, 1931), Finland (e.g., Lindberg, 1906; Cederkreutz, 1927; Eklund, 1934).

Pojarkova (1939: 450) puts *C. curvisepala* Lindm. as a synonym of *C. kyrtostyla* Fingerh. (if it is correctly interpreted?). The distribution of the latter is as follows: Upper Dnieper district, Middle Dnieper distr., Wolga-Don distr., Lower Don distr., Czernichów distr., Upper Crimea, Caucasus. General distribution of *C. kyrtostyla* (according to the U.S.S.R. Flora) is as follows: Central Europe, southern Scandinavia, southern Balkan Peninsula and Asia Minor.

Hegi assumed (1923: 739) that Lindman's species in many instances should be regarded as an occasional segregation of hybrids frequently occurring in this genus; this assumption, however, proved to be ill founded.

II. ORIGINAL INVESTIGATIONS.

A. INTRODUCTION.

Special attention has been paid to the size of the fruits, since I regard them, with Lindman and Szafer, as an important feature for distinguishing the species and forms. The material on which the present study is based consists of the following: (1) specimens collected by myself in the London area (the Thames riverside between Richmond and Twickenham, Ruislip Common, Ruislip Lido Common, Wimbledon Common, Petersham Road); (2) hawthorns kindly sent me by Mrs B. C. Mitchell of Killearn, Stirlingshire; (3) specimens sent me by Lieut. A. Środoń from Northumberland and Stanford Le Hope, Essex; (4) material from the following Herbaria: (a) Royal Bot. Gard. Kew; (b) British Museum (Nat. Hist.); (c) G. C. Druce's Herbarium at Oxford.

As far as I am aware, no paper dealing with the fruits of Hawthorns has appeared in this country. J. W. White (1912: 300) gives a short reference to the size of the fruits of *C. monogyna* var. *splendens* Druce: "A most handsome form, with the fruit about four times heavier than that of the type. Six ripe fruits weighed seven grammes, while six ordinary haws of average size were under two grammes. The measured dimensions averaged 15 mm. by 12 mm., against 9 by 8 in type *monogyna*." Druce's varieties and forms are mainly based on the shape of the leaves. He distinguished according to the fruits the following varieties: (1) *C. monogyna* [var.] *splendens* (Druce) Druce (1928: 42), previously described by Druce (1906: 29-30) as *C. Oxyacantha* var. *splendens*. "Distinguished from *C. oxyacantha* by the much larger fruit, and by the more wedge-shaped leaves, which are of a pale yellowish

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[7] In Denmark the genus *Crataegus* has been carefully investigated by C. Raunkiaer (1934). He described the following new species: *C. Schumacheri*, *C. eremitagensis*, *C. raaradensis*, but nothing is yet known about these species in this country.

green. It is a one-styled plant, showing no evidence of the presence of *C. oxyacanthoides*, and therefore cannot be referred to *C. oxyacanthoides* var. *macrocarpa*, Heg. . . . The fruit is twice the size of the normal Hawthorn," . . . This proportion is not quite accurate, as will be shown later. (2) *C. monogyna* [var.] *subcristata* Druce (1928: 42) originally described (1916: 196) as: *C. Oxyacantha* L., vel. *C. monogyna* Jacq., var. vel forma *subcristata*. " Differs from the type by its small 8-10 × 5 mm. narrow one-styled fruit, in which the calyx lobes, instead of being recurved more or less, and closely applied to the fruit, are spreading or erect. The leaves are mostly trilobed," . . . Related to this variety is: " *C. monogyna* Jacq., var. *urceolata* Hobkirk, in *Nat.*, *3*, 19, 1867. Fruit twice as long as broad, leaves deeply divided and not so generally serrated as type. Thirsk, York, J. G. Baker " (*B.E.C. 1915 Rep.*, 197). An interesting note on *C. monogyna* Jacq. var. vel monstr. is given in the *B.E.C. 1931 Rep.*, 556: " In this instance the well-formed haws retain their petals permanently until the fruits begin to change colour, so at a short distance it suggests that the plant is flowering. Torberry Hill, South Harting, W. Sussex, July 1931, E. B. Bishop and W. Biddiscombe. A most interesting state."

Syme (1864: 237) says that the fruit of *C. monogyna* is smaller than that of *C. oxyacanthoides*, which Tansley (1939: 260) repeats. No special attention is paid to the size of the fruits in the various editions of Babington's *Manual*, Bentham & Hooker's *Handbook*, or Hayward's *Botanists' Pocket-Book*.

Only a general report on the size of the fruits was given by Hegi. He says (1923: 732, 735) that the fruit of *C. monogyna* Jacq. is 7-10 mm. long, while that of *C. oxyacanthoides* is up to 12 mm. long. The size of the fruits was inadequately treated by Ascherson and Graebner (1906). Pojarkova (1939: 437, 454) generally assumes that the fruit length of *C. oxyacanthoides* is up to 12 mm., but that of *C. monogyna* is not recorded there. It should be added that Szafer (1923: 237-8) described a new form of *C. monogyna* found in Poland which had large fruits (13 × 9 mm.) and typical leaves and called it f. *macrocarpa*, which seems to be related to Druce's var. *splendens*. So far as I am aware, the variability of the fruits of *Crataegus* spp. in Poland has not yet been fully noted. The fresh Hawthorn material collected by myself and that kindly sent me proved more valuable than the dried specimens in Herbaria, because the berries had not shrunk through drying. Measurements have been mainly based on material of this sort. The material of *C. monogyna* collected by myself or sent to me by correspondents came from 419 shrubs and that of *C. oxyacanthoides* from 91 shrubs. Owing to war-time restrictions the facilities for field work were somewhat limited, and this investigation should not be regarded as exhaustive.

B. BIOMETRICAL ANALYSIS OF CRATAEGUS MONOGYNA.

The means of length and breadth of fruits of *C. monogyna* have been based on 419 specimens. From 362 shrubs only one fruit from each was examined. Special care was taken that the fruit selected should represent the average size for the twig collected from each shrub (as far as this was possible by visual observation). From 57 shrubs a larger number of fruits was taken (up to about 100 from each specimen). To some of these 57 specimens more attention was paid because their fruits were of unusual size or shape from the average size or having different proportions of length to breadth. Several biometrical constants such as the mean, the standard deviation, the coefficient of variation, their standard errors and the correlation coefficient of length to breadth of fruits for the 419 specimens have been specially calculated. The results are given in the table below.

Crataegus monogyna Jacq.

Length of Fruits.			Correlation coefficient of length to breadth.	Breadth of Fruits.		
Mean mm.	Standard deviation mm.	Coefficient of variabil. %		Mean mm.	Standard deviation mm.	Coefficient of variabil. %
8.7±0.21	4.38±0.15	50.07±2.11	+0.42	7.5±0.22	4.47±0.15	59.29±2.65

The average values of the means of the fruits are as follows: For length of fruits, lm. = 8.7 mm. (say 9.0 mm.); for breadth of fruits, bm. = 7.5 mm. (say 7.0 mm.). It should be emphasised that the mean of length and breadth of fruits in this country agrees with that for Polish *C. monogyna* (Szafer, 1923: 237), i.e. 9 × 7 mm.

Average length of fruits, mm.	Number of fruits (class of frequency).	% of frequency.	Average breadth of fruits, mm.	Number of fruits (class of frequency).	% of frequency.
6	9	2.1	5	9	2.1
7	39	9.3	6	53	12.6
8	131	31.2	7	139	33.2
9	150	35.8	8	138	32.9
10	62	14.8	9	70	16.7
11	18	4.3	10	9	2.1
12	8	1.9	11	1	0.2
13	2	0.5			
Total	419	99.9	Total	419	99.8

The data for the frequency curves of the variation in size are also shown. In the Hawthorn material three types of specimens have been distinguished: (1) With small fruits; (2) with typical mean; (3) with large fruits. All intermediates between these groups have been met with.

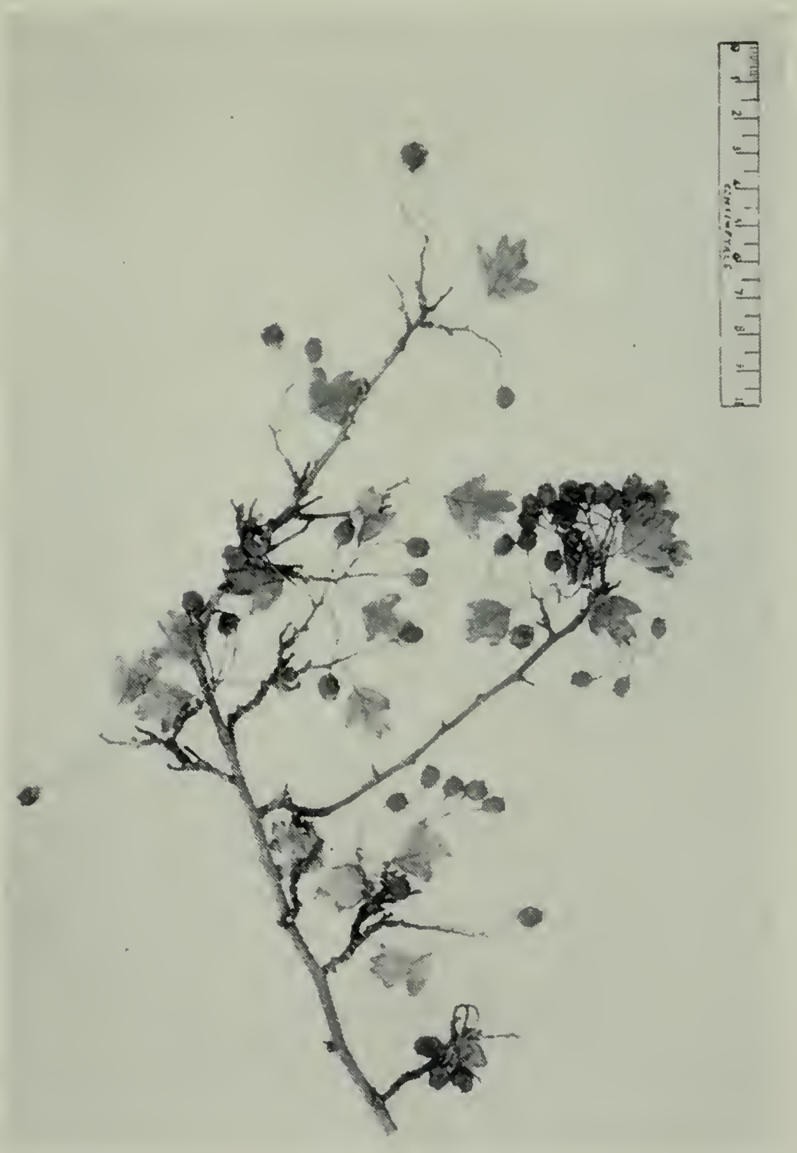
The colour of the fruits of *C. monogyna* is very variable also; they may be: bright coral red, coral red, dark coral red, cherry red, dark cherry red, while sometimes berries are almost black (especially during late autumn). The dark colours generally predominate. Attention has also been paid to the sepals. The sepals in the majority of specimens are obtuse, but the proportion of length to breadth varies. They may be: 1:1, 1.5:1, 2:1. Elongate and acute sepals several times as long as broad are only rarely to be met, for example in *C. monogyna* var. *pteridifolia* Loud. The sepals in the majority of specimens are adpressed, but sometimes they may be partly adpressed, partly ascending and divergent (not convergent like those of *C. calycina*). Fruits are, as a rule, one-stoned; occasionally two-stoned. While the ripe fruits are generally glabrous some specimens have hairy fruits. The stones of one-stoned fruit are furnished on the ventral side with two longitudinal shallow furrows, which are sometimes slight. The presence of an inner friable layer of fruit pulp in *C. monogyna* has been pointed out by Ascherson et Graebner (1906: 27). This layer, however, was not always equally developed in the fruits examined, sometimes it was quite distinct, sometimes less so.

Leaves. Less attention was paid to the leaves, but the following observations may be useful. The leaves examined usually have more or less cuneate bases. The margin is generally entire or slightly toothed; the lobes are obtuse, rarely acute. These characteristics are similar to those of the leaves examined by Lindman and Szafer. Sometimes leaves are deeply cut (forma *fissa* Poir. = f. *laciniata* Stev. = " f. *pinnatifida* " Lindm. = *C. laciniata* Lodd. *Cat.*). The leaves on " Lammas shoots " and suckers, however, are more variable. On two specimens of *C. pterifolia* Lodd. (*Cat.*) = *C. monogyna* var. *pteridifolia* Loud. (Druce: 1928) investigated the leaves were similar to those of *C. monogyna* var. *laciniata*. The author has not found this in Poland. Occasionally leaves are found which resemble those of *C. lagenaria* Fisch. & Mey. Moreover, the petioles of some specimens are very long (about to 4 cm. l.). [The length of petiole of *C. monogyna* is given by Ascherson & Graebner (1906: 27) only about 1-2 cm.]

BRIEF DESCRIPTION OF THE SPECIMENS OF C. MONOGYNA USED IN THE ANALYSIS.

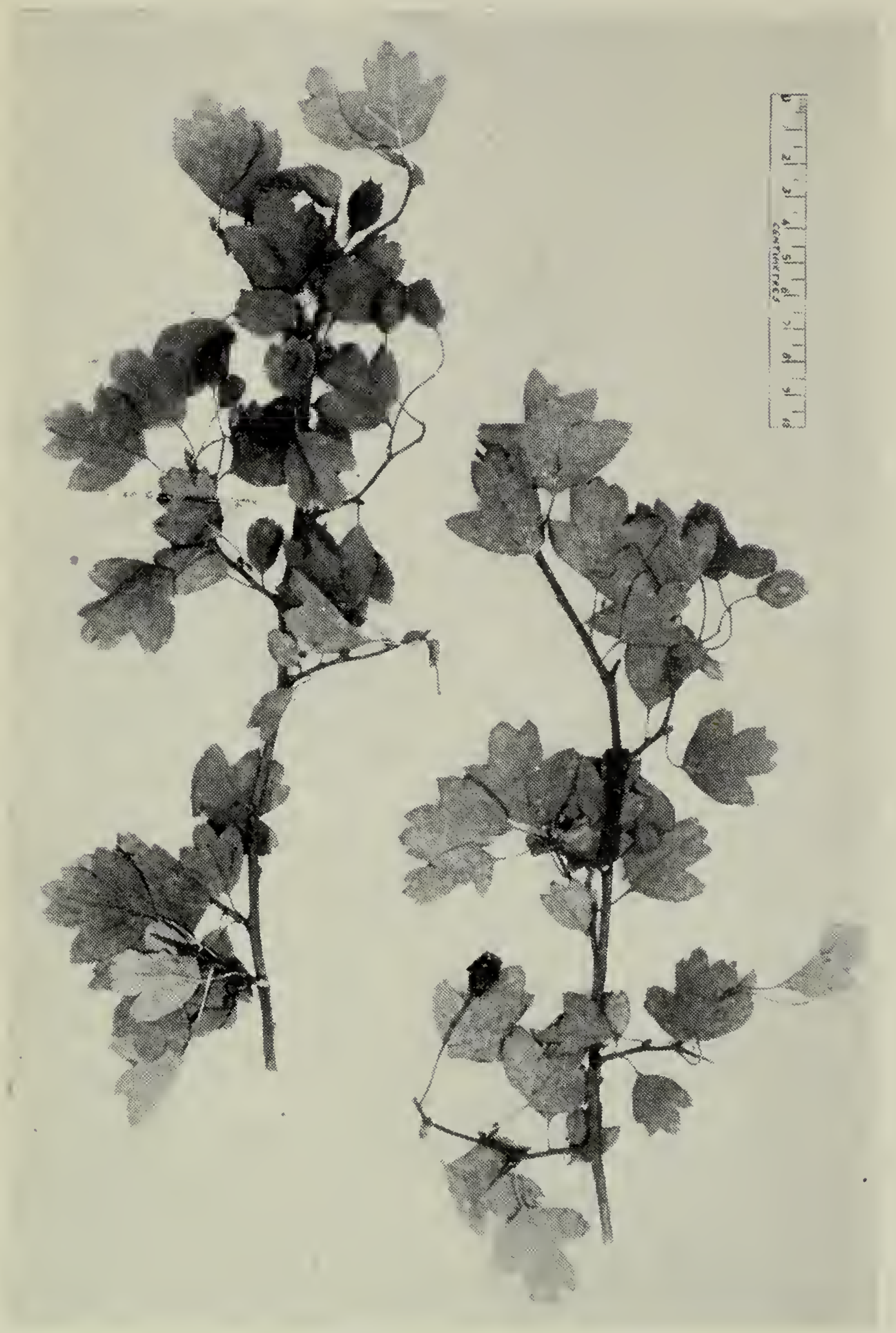
1. A specimen from the Thames riverside between Richmond and Twickenham. This had small cherry-red berries. Mean length of fruits 6 mm., mean breadth 6 mm. Sepals short, adpressed. Stones small, about 4 × 3 mm. Leaves typical, rather small. Further specimens of *C. monogyna* with small fruits and intermediate were also noted: between Richmond and Kingston (Petersham Road), on Wimbledon Common, on the Chiltern Hills, and in Bricket Wood (Herts.). Here it should be stated that the writer saw in the Kew Herbarium a number of specimens of *Crataegus* spp. (from Dalmatia and Hercegovina) with small fruits, which should be referred either to *C. Inzengae* (Tin.) Bertol. or to *C. transalpina* Kern. ex Hayek, both of which are related to *C. monogyna*.

2. A specimen from the Thames riverside between Richmond and Twickenham with fruits of intermediate size. Mean length of fruits 7 mm., mean breadth 6 mm. Fruits dark cherry-red with sepals ascending or spreading. Stones about 5 × 3 mm. Leaves typical.



Crataegus monogyna Jacq. with small fruits (1). Thames riverside between Richmond and Twickenham. Coll. S. Batko. 21 x 42.

From the Trower Fund.



Crataegus monogyna Jacq. var. *splendens* Druce (5). Scrub near Ruislip Common. Coll. S. Batko, 9/x/42.

From the Trower Fund.

3. A typical specimen of *C. monogyna* from Wimbledon Common. Fruits cherry red. Sepals short, adpressed. Mean length of fruits 9 mm., mean breadth 7 mm. Stones about 6 × 4 mm. Leaves typical.

The writer saw in the Kew Herbarium specimens of *C. monogyna* with typical fruits from the continent also, e.g., one specimen was labelled "C. K. Schneider, Iter balcanicum 1907, No. 210, 13 Jan. 1908. *Crataegus monogyna* typica. Bulgaria prope Varna in collinis versus Francka ♄, ad 1 m., 20.v., leg. Schneider." Four dried fruits were measured. The approximate dimensions are as follows: 9 × 6, 9 × 7, 9 × 6, 8 × 7 mm. Another specimen was labelled " Cyprus, No. 542. *Crataegus monogyna* Jacq. Plátres, 23.10.37, 3500 feet. Erw. Kennedy. On steep dry mountainside among bushes of garigue." The approximate dimensions of six dried fruits are as follows: 9 × 7, 8 × 8, 8 × 7, 8 × 7, 9 × 7, 8 × 8 mm.

4. A specimen of *C. monogyna* intermediate between the typical plant and var. *splendens*. Fruit cherry red. Mean length 11 mm., mean breadth 9 mm. Sepals acute, ascending, rarely adpressed or spreading. The friable layer of fruit pulp weakly developed. Leaves typical. Locality: Thames riverside between Richmond and Kew.

5. *C. monogyna* var. *splendens* Druce. Fruits cherry red, large. Mean length 13 mm., mean breadth 9 mm. Bushes near Ruislip Common. This is an interesting variety described by Druce, who says: " The fruit is twice the size of the normal." According to my observation, this proportion is excessive. [Not by surface or volume.—ED.] The largest fruits of this variety which I have seen are: 15 × 10 mm., 14 × 11 mm., while the normal size of fruits of typical *C. monogyna* is 9 × 7 mm.

C. E. Salmon (1931: 307) says of the fruits of var. *splendens*: . . . " The haws on the various bushes examined averaged as follows: Pilgrims' Way, 14 mm. × 12; Walton Heath, 12 × 10½; Buckland Hill, 12 × 10; Colley Lane and Betchworth, 11 × 10. Anything smaller than the last cannot, I think, be admitted as *splendens*."

This variety is well represented both in Druce's Herbarium and in the British Museum herbarium. It is related to *C. monogyna* f. *macrocarpa* Szafer. Szafer's specimens have large fruits, 13 × 9 mm. (stones 9 × 5 mm.). Leaves typical. Szafer's form has been found in Switzerland also, see one specimen in the Kew Herbarium labelled " Flora von Baselland. *Crataegus monogyna* Jacq. var. *macrocarpa* Szaf. Gebüsch am Birsig bei Binningen, 9.9.1931. Paul Aellen." In the Kew Herbarium there is also a specimen from Afghanistan labelled: " Kurum Valley Plants, 1879. *Crataegus Oxyacantha* L. With very large fruit; may be a variety. A common shrub at 8000 feet round Shálizán; usually forms a good tree in the Hariáb district." There is on the same sheet the second label also: " *Crataegus Oxyacantha* L. var. Kurum Valley, Afghanistan, 1879. Coll. and comm. Dr J. E. T. Aitchison, Dec. 1879." The specimen is, in fact, *C. monogyna* f. *macrocarpa* Szafer.

6. *C. monogyna* var. *pteridifolia* Loud. Fruits large, coral red. Mean length 12 mm., mean breadth 9 mm. Sepals narrow, several times as long as broad, partly adpressed, partly ascending. Leaves rather large, pinnate, with long petioles (up to 3.5 cm.). One small tree on the Thames riverside between Richmond and Kew; coll. S. Batko, 22.x.1942. There are also in Kew Herbarium fruiting twigs of the same tree collected much earlier by J. Fraser: (1) 30th May, (2) 3rd October 1928. The writer also saw one specimen belonging to this form on the Thames riverside between Richmond and Twickenham. Mean length of fruits 12 mm., mean breadth 10 mm. Leaves and sepals like those of the first specimen. This form is also represented in Druce's Herbarium. The distribution of *C. m. pteridifolia* in this country and the general distribution are not quite clear. Loudon (1839: 831) says: " There are only small plants of this very elegant and interesting variety in the Fulham Nursery, at Messrs Loddiges, and in one or two other collections." K. Koch (1862: 407) reported it in a part of Yugo-Slavia (Montenegro) and in the Botanic Garden at Petersburg (Leningrad). Ascherson et Graebner (1906: 30) say only: " Der Abart *fissa* ähnliche Formen sind: *C. Oxyacantha pteridifolia*, . . . ect. der gärten.—*Mesp. monog. . . . pteridifolia* K. Koch a.a.O. (1869)." No description of the fruits has been found. Hence it is clear that the distribution needs further study.

The following tables give the results of an analysis of the variability in size of the fruits of *C. monogyna* based on the above six plants selected to cover the extreme ranges.

No.	Name of specimen.	Class of Length Limits (mm.) and Number of Fruits.											
		4.5-5.5	5.5-6.5	6.5-7.5	7.5-8.5	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5	13.5-14.5	14.5-15.5	Total.
1.	*Crat. monog.*, with small fr.. Rich., Twick.	1	20	4	—	—	—	—	—	—	—	—	25
2.	*Crat. monog.*, intermediate, Rich., Twick.	—	1	12	12	—	—	—	—	—	—	—	25
3.	*Crat. monog.*, typical, Wimbl. Comm.	—	—	—	6	17	2	—	—	—	—	—	25
4.	*Crat. monog.*, intermediate, Rich., Kew.	—	—	—	—	2	6	8	8	1	—	—	25
5.	*Crat. monog.*, *splendens*, Ruislip.	—	—	—	—	1	—	—	3	11	9	1	25
6.	*Crat. monog.*. *pteridifolia*, Rich., Twick.	—	—	—	—	—	—	3	17	5	—	—	25

No.	Name of specimen.	Class of Breadth Limits (mm.) and Number of Fruits.							
		4.5-5.5	5.5-6.5	6.5-7.5	7.5-8.5	8.5-9.5	9.5-10.5	10.5-11.5	Total.
1.	*Crat. monog.*, with small fr., Rich., Twick.	3	22	—	—	—	—	—	25
2.	*Crat. monog.*, intermediate, Rich., Twick.	—	12	13	—	—	—	—	25
3.	*Crat. monog.*, typical, Wimbl. Comm.	—	3	20	2	—	—	—	25
4.	*Crat. monog.*, intermediate, Rich., Kew.	—	—	—	2	18	5	—	25
5.	*Crat. monog.*, *splendens*, Ruislip.	—	—	—	3	13	8	1	25
6.	*Crat. monog.*, *pteridifolia*, Rich., Twick.	—	—	—	—	6	19	—	25

Three further specimens of special interest should be referred to here although their fruits were not made use of in constructing the curves of variability.

(a) *C. monogyna* with fruits broader than long. Mean breadth 10 mm., mean length 9 mm. (this mean based on 25 fruits). Some of the sepals short, adpressed, others ascending and others curved-ascending. Fruit colour dark cherry red. Stones 6 × 4 mm. Leaves typical. Thames riverside between Richmond and Twickenham.

(b) *C. monogyna* var. *urceolata* Hobkirk. Fruits narrow, cylindrical. Mean length 12 mm., mean breadth 7 mm. (this mean based on 10 fruits). Leaves mostly trilobed. Stones 7 × 4 mm., flattened. In scrub near Ruislip.

(c) *C. monogyna* var. *sibirica* Loud. Two specimens labelled with this name were found in Kew Gardens. The shape of the leaves, the structure of the stones (smooth or almost smooth on the ventral side), and the fruits with sepals ascending, relate them to *C. microphylla* Koch. (C. *lagenaria* Fisch. & Mey., *C. pinnatiloba* Lange) from the Caucasus. Loudon (1839: 830) reports it as " a native of Siberia," but according to the latest treatment of *Crataegus* (Pojarkova, 1939) true *C. monogyna* does not grow in Siberia. [But in former times the term Siberia included parts of south-east European Russia.—Ed.] K. Koch (1862: 407) regards *C. sibirica* Lodd. as synonymous with " *Mespilus* " *monogyna* All. *dissecta* Dum. and says: " Eine nur in Transkaukasien und Persien, aber auch, wie es scheint, am Altai vorkommende Abart."

No mention of this interesting Hawthorn was given by Schneider (1906). Its exact relation to *C. microphylla* is not altogether clear and requires fuller study.

C. BIOMETRICAL ANALYSIS OF C. OXYACANTHOIDES.

The mean length and breadth of the fruits is here based on 92 specimens. From 31 specimens only one fruit was examined. Special care was taken to ensure that this fruit should represent the mean size for the twig collected from each shrub. From 61 shrubs more fruits were examined (up to about 100). The means of these 61 shrubs have been included in the general number of 92 specimens whose mean is given below.

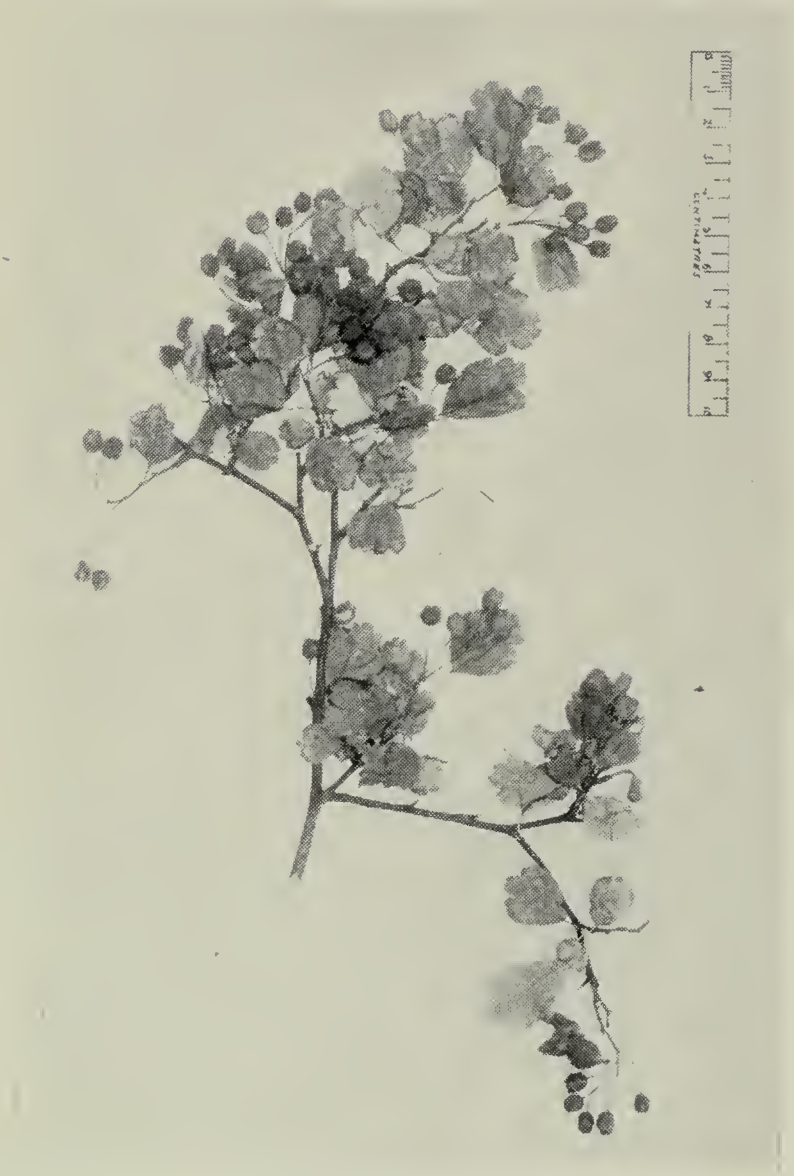
Average length of fruits, mm.	Number of fruits (class of frequency).	% of frequency.	Average breadth of fruits, mm.	Number of fruits (class of frequency).	% of frequency.
6	1	1.1	6	1	1
7	3	3.2	7	4	4.3
8	25	27.1	8	27	29.3
9	33	35.8	9	40	43.4
10	20	21.7	10	17	18.4
11	6	6.5	11	3	3.2
12	2	2.1			
13	2	2.1			
Total	92	99.6	Total	92	99.6

The average values of the means of the fruits are as follows: For length of fruits lm. = 9.1 mm. (say 9.0 mm.), for breadth of fruits bm. = 8.8 mm. (say 9.0 mm.). So the shape of the fruits is almost globular. The data for the frequency curves for the variation in size of the fruits are also shown. The same biometrical constants as given for *C. monogyna* have been calculated and the results are given below.

Crataegus oxyacanthoides.

Length of Fruits.			Correlation coefficient of length to breadth.	Breadth of Fruits.		
Mean mm.	Standard deviation mm.	Coefficient of variabil. %		Mean mm.	Standard deviation mm.	Coefficient of variabil. %
9.1±0.32	3.04±0.22	33.3±2.7	+0.82	8.8±0.25	2.37±0.17	26.84±2.11

As with *C. monogyna*, the following different types were represented among the material: (A) shrub with small fruits; (B) shrub with typical fruits; (C) shrub with large fruits; and (D) shrubs with intermediate fruits between A and B and B and C, and the following tables represent an analysis of the fruit size of *C. oxyacanthoides* and *C. Palmstruchii.*



Crataegus oxyacanthoides Thuill. with small fruits (1). Ruislip.
Coll. S. Batko, 9/x/42.

From the Trower Fund.

No.	Name of specimen.	Class of Length Limits (mm.) and Number of Fruits.											
		4.5-5.5	5.5-6.5	6.5-7.5	7.5-8.5	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5	13.5-14.5	14.5-15.5	Total.
1.	*Crat. oxyac.*, with small fr., Ruislip.	2	21	2	—	—	—	—	—	—	—	—	25
2.	*Crat. oxyac.*, intermediate, Rich., Twick.	—	6	11	8	—	—	—	—	—	—	—	25
3.	*Crat. oxyac.*, typical, Ruislip.	—	—	—	—	5	18	2	—	—	—	—	25
4.	*Crat. oxyac.*, intermediate, Ruislip.	—	—	—	—	—	—	1	8	16	—	—	25
5.	*Crat. oxyac.*, intermediate, Ruislip.	—	—	—	—	1	—	9	12	3	—	—	25
6.	*Crat. Palmstruchii*, Ruislip.	—	—	—	—	—	—	—	3	10	10	2	25

No.	Name of specimen	Class of Breadth Limits (mm.) and Number of Fruits.									
		4.5-5.5	5.5-6.5	6.5-7.5	7.5-8.5	8.5-9.5	9.5-10.5	10.5-11.5	11.5-12.5	12.5-13.5	Total.
1.	*Crat. oxyac.*, with small fr., Ruislip.	11	13	1	—	—	—	—	—	—	25
2.	*Crat. oxyac.*, intermediate, Rich., Twick.	—	—	6	19	—	—	—	—	—	25
3.	*Crat. oxyac.*, typical, Ruislip.	—	—	—	—	9	12	4	—	—	25
4.	*Crat. oxyac.*, intermediate, Ruislip.	—	—	—	—	5	4	15	1	—	25
5.	*Crat. oxyac.*, intermediate, Ruislip.	—	—	—	1	4	11	7	2	—	25
6.	*Crat. Palmstruchii*, Ruislip.	—	—	—	—	—	3	8	11	3	25

FURTHER DETAILS REGARDING THESE SPECIMENS.

1. *C. oxyacanthoides* with small fruits. One shrub. Mean length of fruits 6 mm., mean breadth 6 mm. Stones about 5 × 4 mm. Leaves small, about 2.5 × 2 cm. Locality: London area, near to Ruislip Common. [Another specimen with small fruits was seen in the Druce Herbarium labelled: "Ryarsh Wood, West Kent, August 24, 1930.—J. E. Lousley." Fruits small, about 6 × 6 mm. Leaves rather small: a

duplicate from the same bush is in the Kew Herbarium. There is also a third small fruited specimen of *C. oxyacanthoides* in Kew Herb. labelled: "Ex Herb. C. E. Britton. In hedge between Lower Morden and North Cheam, Surrey. Coll. C.E.B., 1.ix.1907." Leaves and fruits are small.]

2. *C. oxyacanthoides* intermediate specimen. Mean length of fruits 7 mm., mean breadth 8 mm. Stones 5 × 4 mm. Leaves rather small. Locality: Thames riverside between Richmond and Twickenham.

3. *C. oxyacanthoides* almost typical specimen. Mean length of fruits 10 mm., mean breadth 10 mm. Stones about 7 × 5 mm. Sepals twice as long as broad, often ascending. Locality: near Ruislip Common.

4. *C. oxyacanthoides* intermediate. Fruits coral red, large. Mean length 13 mm., mean breadth 10 mm. Stones about 8 × 5 mm. Leaves rather small, about 2.5 × 2 cm. The fruits of this specimen are almost as large as those of *C. Palmstruchii*. The leaves are, however, much smaller. Locality: near Ruislip Common.

5. *C. oxyacanthoides* intermediate. Fruits large, dark coral red. Mean length 12 mm., mean breadth 10 mm. Leaves rather small, about 2.5 × 2.5 cm. Locality: near Ruislip Common.

6. *C. Palmstruchii* Lindm. Fruits coral red, very large. Mean length of 100 fruits 12.88 mm. (say 13 mm.), mean breadth 11.03 mm. (say 11 mm.). Stones about 9 × 7 mm. with structure very like those of *C. oxyacanthoides*. Leaves as typical in *C. oxyacanthoides*, but larger (av. 4.5 × 3 cm.), and feebly lobed. This specimen, distinguished by its very large fruits and large leaves, proved to be *C. Palmstruchii* Lindman (1918.) Not previously recorded from the British Isles. One shrub about 4 m. high. Locality: rough ground in Park Avenue, Ruislip.[8] There are in the Druce Herbarium (Oxford) several specimens with large leaves but without fruits resembling this Hawthorn. Its distribution in Europe (already given) has been only partially investigated.

The following biometrical constants have been calculated:—

Crataegus Palmstruchii.

Length of Fruits.			Correlation coefficient of length to breadth.	Breadth of Fruits.		
Mean mm.	Standard deviation mm.	Coefficient of variabil. %		Mean mm.	Standard deviation mm.	Coefficient of variabil. %
12.88±0.25	2.52±0.18	19.56±1.43	+0.71	11.03±0.23	2.33±0.16	21.12±1.56

Leaves of *C. oxyacanthoides* are, generally speaking, much less variable in shape than those of *C. monogyna*. The general shape is obovate, mostly 3-lobed with crenate margin. There is, however, not always a

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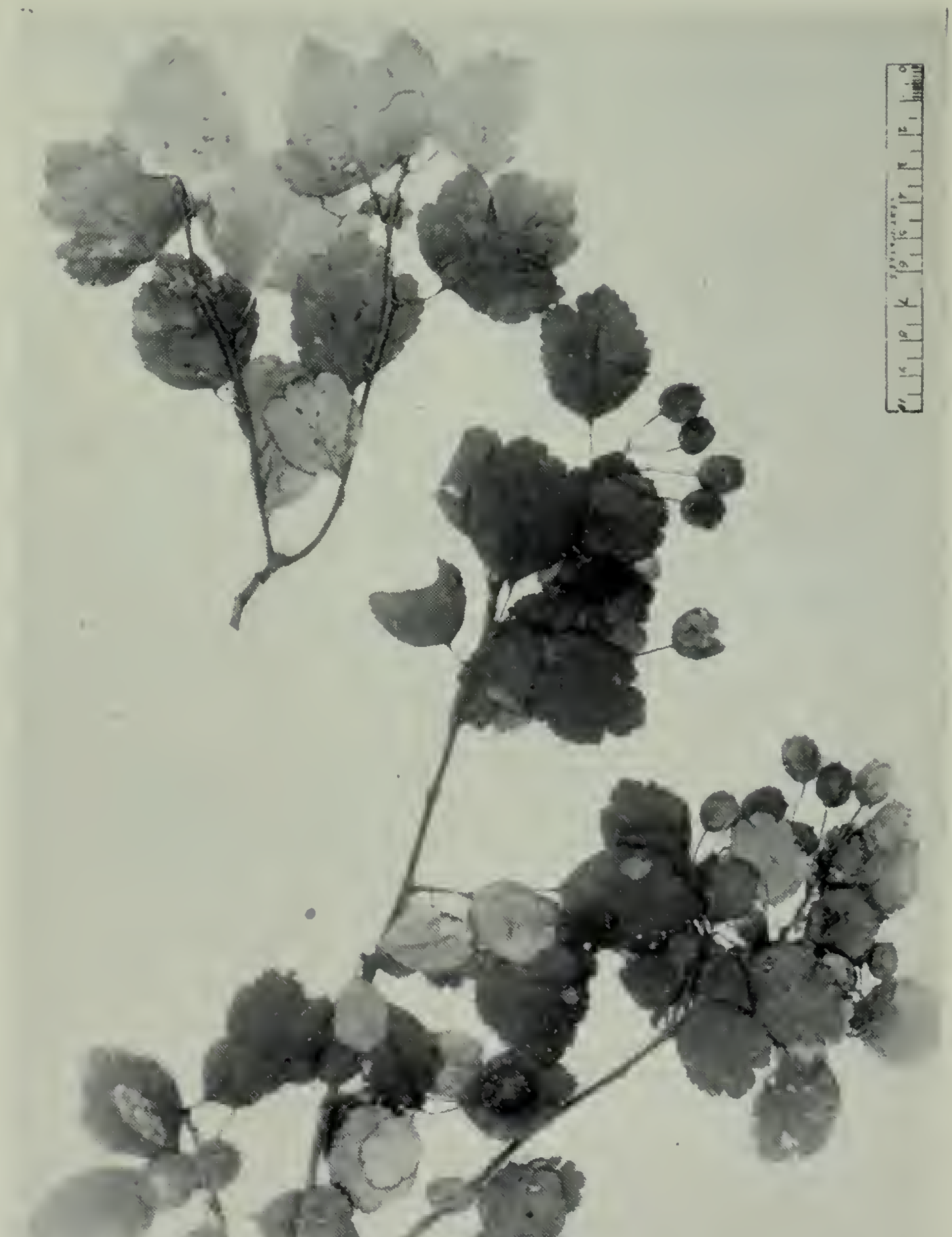
[8] The writer has seen two other specimens related to *C. Palmstruchii*. The first is in the Royal Bot. Gardens, Kew, labelled: *C. oxyacanthoides*. The second is at Killearn (Stirlingshire) in the garden of Mrs B. C. Mitchell, possibly planted.



Crataegus Palmstruchii Lindm. Rough ground in Park Avenue, Ruislip. Coll. S. Batko, 18/ix/42.

From the Trower Fund.

close relationship between the size of the leaves and that of the fruits.[9] Specimens may often be found with small leaves but large fruits, as reported above. The leaves on "Lammas shoots" are, however, more variable than those on usual shoots. Worthy of mention is the variety *C. oxyacanthoides* var. *cuneatiformis* Druce (1924: 35): "Differs from the type in its long, narrow, very cuneate leaves, which are long lobed only at or near the apex." The writer saw and collected this variety in Ruislip Wood (5th October 1944).

D. CRATAEGUS HYBRIDS—C. MONOGYNA × OXYACANTHOIDES.

1. A shrub with rather small intermediate leaves. Mean length of fruits 9 mm., mean breadth 9 mm. A sample of 25 fruits showed sixteen one-stoned (64%), nine two-stoned (36%). The structure of the stones was intermediate. Locality: Thames riverside between Richmond and Twickenham.

2. A tall shrub with leaves more resembling those of *C. oxyacanthoides.* Flowers mostly one-styled with hairy calyx, fruits dark pink, hairy. A sample of 25 fruits showed 23 one-stoned, 2 two-stoned. The structure of stones is nearest to those of *C. oxyacanthoides*; they have two rather deep and sharp longitudinal furrows on the ventral side. Locality: Park Avenue, bushes near Ruislip Common.

E. CRITICAL SPECIMEN.

One specimen sent me by Lieut. A. Środoń and collected "North of Stanford le Hope near One Tree Hill Forest, Essex," will be described here. It resembles *C. macrocarpa* Hegetschw., known from high altitudes in the Swiss Alps. Hegetschweiler says (1840: 464): ". . . *Crataegus macrocarpa* nob. Langfrüchtiger W. Ein dorniger Strauch von 15-20′ Höhe. Bltr. eirund oder eirund-trapezoidisch nach vorne 3-5 lappig; die Lappen zugespitzt u. spitzig gesägt. Blmn. weiss meist eingriffelig. Fr. gross, cylindrisch, länger als dick, am Grunde 5 höckerig, meist einsteinig. 5, 6. In Hecken u. Gebüschen besonders in montanen Gegenden." . . . Gremli (1881: 180) says that the leaves of "*Mespilus Oxyacantha* [var.] b. *macrocarpa* Heg." resemble very closely those of *C. monogyna.* In spite of these differences in leaves, Gremli there included *C. macrocarpa* in *C. oxyacanthoides.* Later (1901: 172) he says that it is an intermediate between *C. oxyacanthoides* and *C. monogyna* and possibly partly of hybrid origin. The leaves, he says, are more like those of *C. monogyna*; the flower-stalks are mostly hairy. Both one- and two-styled specimens can be met with. Fruits larger than those of the two preceding species, furnished at the base with 5 small swellings. In 1901 Gremli treated *C. macrocarpa* Hegetsch. as a separate species. Hegi (1923: 733) regards *C. macrocarpa* as a variety of *C. oxyacanthoides.* He says: "var. *macrocarpa* (Hegetschw.) Gremli. A small shrub, very weakly branched. Leaves smaller [than those of var. *vulgaris* DC.], deeply lobed to the middle of the blade. Berries very large up to 1.2 cm. long and up to 8 mm. broad, with 5 swellings at the base." It is not clear why Hegi says " small " because in Hegetschweiler's original description the height is given as 15-20′ [1′=1 foot], i.e. higher than that of *C. monogyna* (6-15′) and that of *C. oxyacanthoides* (10-15′). It grows, according to Hegi, at high altitudes in the Alps. Hegi (1923 : 733) says that according to R. Buser it is a distinct species, while according to O. Buser and Brügger it is a hybrid between *C. monogyna* and *C. oxyacanthoides.* Evidently the taxonomic status of *C. macrocarpa* is still not clear, nor is its distribution yet accurately known. Apart from Switzerland, it occurs (Buser, 1897 : 14) in Voralberg, leg. Zollikofer, probably in district Spa and in Thüringia. It has been recorded by Druce (1915 : 143) from the British Isles : " *Crataegus oxyacanthoides* Thuill. var. *macrocarpa* Heger. (sic !) [Ref. No. 70] Virley, N. Essex, v.-c. 19, May 31, 1914; fruit, September 6, 1914, teste G. C. Druce. Mr Druce says *in lit.* : ' The leaves are not quite typical *oxyacanthoides.* The size of the fruit brings it under var. *macrocarpa* Heger, which I have seen in Essex, both North and South.'—G. C. Brown." There is material of this in Herb. Kew, the British Museum, and the Druce Herbarium ; the leaves are 3-lobed, sharply toothed. Styles 1 or 2. We must, however, be very careful, in stating the distribution of *C. macrocarpa* Hegetschw. in the British Isles, to avoid confusion with ordinary hybrids between *C. monogyna* and *C. oxyacanthoides.* There is in the Herbarium at Kew a specimen of " *Mespilus* (*Crataegus*) *Oxycantha* Gäertn. var. *macrocarpa* Heg. Marbach Com. St.-Gall. juin 79. Zollikofer." This is a flowering twig. The leaves are sharply toothed, 3-lobed, with round bases. The majority of the flowers are two-styled.

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[9] This agrees with Druce's observations (1916: 197) on *C. oxyacanthoides* var. *microphylla.*

Lieut. Środoń's specimen agrees quite well with Gremli's description of *C. macrocarpa.* The leaves of this specimen are rather deeply lobed, more like those of *C. monogyna.* Fruits are both two- and one-stoned. A sample of 25 fruits contained 17 one-stoned (68 %), 8 two-stoned (32 %). All the fruits have characteristic swellings at the base. The fruits are rather large. Mean length of 100 fruits 12 mm., mean breadth 10 mm. Stones large, 7 × 5 mm. Some of the stones have, on the ventral side, irregular furrows resembling those of *C. oxyacanthoides.*

SUMMARY AND GENERAL CONCLUSIONS.

1. The general areas of distribution of *C. monogyna* Jacq. and *C. oxyacanthoides* Thuill. are much smaller than was formerly supposed.

2. The shape of fruits of *C. oxyacanthoides* is more spherical than that of *C. monogyna.*

3. Investigations of the fruits of *C. monogyna* and *C. oxyacanthoides* (fresh and dried material from this country, and dried material from the continent) showed that three types of specimens may be distinguished : (1) With small fruits ; (2) with mean fruits (average size) ; (3) with large fruits. Between these three types, however, intermediates are to be

found. This classification by fruit size is at once simple and accurate. The large fruited *C. Palmstruchii* Lindm. bears the same relation to *C. oxyacanthoides* as *C. monogyna* var. *splendens* Druce does to *C. monogyna*. The distribution of *C. Palmstruchii* and the question of its possible indigenuity in this country need further investigation.

4. Lindman's classification of *Crataegus* has proved to be reliable and to be both simple and clear from the taxonomic point of view.

I am greatly indebted to: Mr A. D. Cotton, Keeper of the Kew Herbarium and Library, for granting facilities for laboratory work; to Prof. M. Skalińska and Mr N. Y. Sandwith for their valuable advice; to Dr C. L. Hare and Mr A. J. Wilmott for kind help in the preparation of my English manuscript; to Mr G. Atkinson for the Hawthorn snaps; to Mrs B. C. Mitchell (Killearn, Stirlingshire) and Lieut. A. Środoń for the material kindly sent me; to Dr N. Polunin and For. Off. F. Czwaczka for help and assistance in the Library of the University of Oxford; and to Mr A. J. Wilmott, J. E. Dandy, and A. B. Jackson for help and assistance in the British Museum.

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THE TYPIFICATION OF CRATAEGUS OXYACANTHA L.

J. E. DANDY.

The original account of *Crataegus Oxyacantha* L., published by Linnaeus in his *Species Plantarum* (1753), p. 477, runs as follows:

> 8. CRATÆGUS foliis obtusis bitrifidis serratis. *Hort. cliff.* 188. *Fl. suec.* 399. *Roy. lugdb.* 272.
> Mespilus, apii folio, sylvestris spinosa s. Oxyacantha. *Bauh. pin.* 454.
> Oxyacantha s. Spina acuta. *Dod. pempt.* 751
> *Habitat in* Europæ *pratis apricis duris.* ♄

From this it would appear at first sight that the definition of the species was taken from Linnaeus's earlier *Hortus Cliffortianus* (1737), and that we should therefore look to that work for the type. The fact is, however, that the definition " foliis obtusis bitrifidis serratis " given in the *Species Plantarum* is not identical with that given in the *Hortus Cliffortianus*, p. 188, which is simply " foliis obtusis bis trifidis " (as also is that given in his *Flora Suecica*). This means that the definition given in the *Species Plantarum* is in effect a new definition, of which the type is not necessarily to be sought in the *Hortus Cliffortianus*, especially as Linnaeus, in changing the definition, must have been influenced by additional material, the Clifford Herbarium being no longer accessible to him.*

Let us nevertheless consider the species which Linnaeus in the *Hortus Cliffortianus* called *Crataegus foliis obtusis bis trifidis*, and under which he cited the same two synonyms (from C. Bauhin and Dodoens) as in the *Species Plantarum*, together with four others from L'Obel, Ruppius, J. Bauhin and Lécluse. It appears that there is no typical specimen of this species in the Clifford Herbarium, now at the British Museum (Natural History). There are, however, two specimens representing the varieties α and β which Linnaeus appended to the species. Of these, the variety α (*Mespilus spinosa*; *sive Oxyacantha flore pleno*) is a one-styled plant which Dr Batko identifies as a double-flowered form of *Crataegus monogyna* Jacq. The variety β (*Mespilus apii folio laciniato*) was raised to specific rank by Linnaeus in the *Species Plantarum* under the name *Crataegus Azarolus*, and so does not concern us here. In the absence of a typical specimen of the *Hortus Cliffortianus* species we cannot be sure what Linnaeus had in mind, though the fact that he regarded a double-flowered form of *Crataegus monogyna* as a double-flowered variety of his species shows that the latter covered one-styled plants. The wide range which he attributed to the species (" *sepibus, montibus, campestribus, pratis per* Sueciam, Germaniam, Angliam & Galliam ") does not help us.

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*The Clifford Herbarium, then housed in Holland, was used by Linnaeus in preparing his *Hortus Cliffortianus*, but after the publication of that work in 1737 he returned to Sweden and did not see the herbarium again.

Turning to Linnaeus's own herbarium, we find that *Crataegus Oxyacantha* was one of the species represented in the first enumeration (c. 1753) and that there are two sheets named *C. Oxyacantha* by Linnaeus himself. The first of these sheets, named " 8. *Oxyacantha* " by Linnaeus, shows a one-styled plant which Dr Batko identifies with *C. curvisepala* Lindm., a species described from Sweden. The second sheet, named " *Oxyacantha* " (with no ordinal number) by Linnaeus, also bears a one-styled plant, but as this is inscribed " Algir[ia] " it must be excluded from consideration in the typification of *C. Oxyacantha*, which by the protologue was restricted to Europe.†

The first of Linnaeus's two sheets—the one which we have to consider—is unlocalized, but the specimen may be assumed to have come from Sweden, especially as Linnaeus referred in the protologue to his *Flora Suecica*. On comparing this specimen with the definition of *C. Oxyacantha* one is at once struck with the fact that the leaves are very noticeably " bitrifidis " and " serratis ". They are, on the other hand, not what one would usually describe as " obtusis ". This discrepancy is the only factor against the specimen being regarded as type of *C. Oxyacantha*, and in my opinion it is a factor which should not be allowed to operate, as it must be remembered that the word " obtusis " is included in that part of the definition copied from the *Hortus Cliffortianus*, where a complex of at least two species (*C. monogyna* and *C. Azarolus*) is involved, and Linnaeus would naturally retain it. It is at all events certain that in adding the word " serratis " to his earlier (*Hortus Cliffortianus*) definition Linnaeus was guided by new material, presumably represented by the specimen in his own herbarium. Neither of the descriptions cited by Linnaeus from the older authors fits the definition better than his own herbarium material does, and I therefore propose that this specimen (on *Crataegus* sheet 12 in the Linnean Herbarium) be regarded as type (i.e. lectotype) of *C. Oxyacantha*.

Dr Batko, as I have already mentioned, refers this specimen to *C. curvisepala*; so that this name should be replaced by *C. Oxyacantha*. The two well-known British species become *C. monogyna* Jacq. (one-styled) and *C. oxyacanthoides* Thuill. (*C. Oxyacantha* of Jacquin, two-styled).

Jacquin applied the name *C. Oxyacantha* to the two-styled species, but although Linnaeus may of course have known the two-styled plant there is no evidence that he ever saw a specimen, all the relevant material in his own herbarium and in the Clifford Herbarium being one-styled. The fact that he placed the genus *Crataegus* in the *Icosandria Digynia* does not affect the question, as, quite apart from *C. Oxyacantha*, the style-number in his other species of the genus varies from two to five.

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†Mr S. Savage kindly informs me that the specimen doubtless came from Eric Brander, who was Swedish Consul in Algiers, and that it was certainly received by Linnaeus later than the other specimen named *C. Oxyacantha*.

A NEW HYBRID SENECIO FROM THE LONDON AREA.

J. Edward Lousley.

The rapidity with which *Senecio squalidus* and *S. viscosus* have spread in the London area is one of the most remarkable botanical phenomena which have come under the observation of the writer, and has led to the occurrence of an easily recognised and undoubted hybrid new to science.

Senecio squalidus L. (1753: *Sp. Pl.*, 869) is a native of the Central Mediterranean. From Sicily, where its classic home is the slopes of Mount Etna, and Southern Italy it has spread to Corsica and the Northern Adriatic, and, according to Druce (*Comital Fl.*, 168, 1932), to Spain and to Southern France. In Britain it was first noticed on the walls at Oxford in 1794 (Sibthorp, *Fl. Oxon.*, viii) whither it appears to have escaped from the Botanic Gardens, where it had been cultivated since before 1699. The spread from Oxford was at first very slow and then, by agency of the railway as well described by Druce (1897: *Fl. Berks.*, 292/3 and 1927: *Fl. Oxon.*, ed. II, 239 seq.) much more rapid. By 1897 the plant had reached Reading and was known in Buckinghamshire (Druce *op. cit.*) but it seems that it did not reach the western outskirts of the Metropolis until about ten years later (21, Middlesex; Southall, Druce in *B.E.C. 1904 Rep.*, 25, 1905; West Drayton, 7th August 1906, C. S. Nicholson, and Hayes, 29th May 1909, Rev. P. H. Cooke, both in Herb. London Nat. Hist. Soc.). Even then progress was comparatively slow and somewhat erratic. By 1930 the plant might still be regarded as rather rare in the London area though it was to be found regularly in many scattered localities. In the last fifteen years *S. squalidus* has increased at a prodigious rate and by the outbreak of war it was already abundant by railways and roads and on waste ground in nearly all the suburbs. The construction of air-raid shelters in 1939 and 1940 afforded an opportunity for the plant to invade the centre of London, while the bare spaces which resulted from the subsequent bombing afforded ideal conditions for the rapid increase of the Oxford Ragwort.

By 1944 *S. squalidus* occurred in abundance on almost every bombed site in London[1], rivalled only in luxuriance by *Epilobium angustifolium*. It is tempting to suppose that the dry, well drained, nidus of brick-dust and mortar provides conditions similar to those of the lava-soils of its native Sicily, while the temperature to which these sites are raised on warm summer days is much higher than is usual in this country. The method by which the seeds are distributed is well known and beyond question. The parachute-like fruits can be seen blowing about in quantity on any dry autumn day, and I have seen them on the window-sill of my City office some sixty feet above street level. Seedlings have been noticed in large numbers in the autumn and germination probably occurs in suitable conditions in all but the winter months. Although described as an annual by Linnaeus, Syme, and many other writers, the plant is apparently perennial in London as in Oxford (Druce, 1927: *op cit.*).

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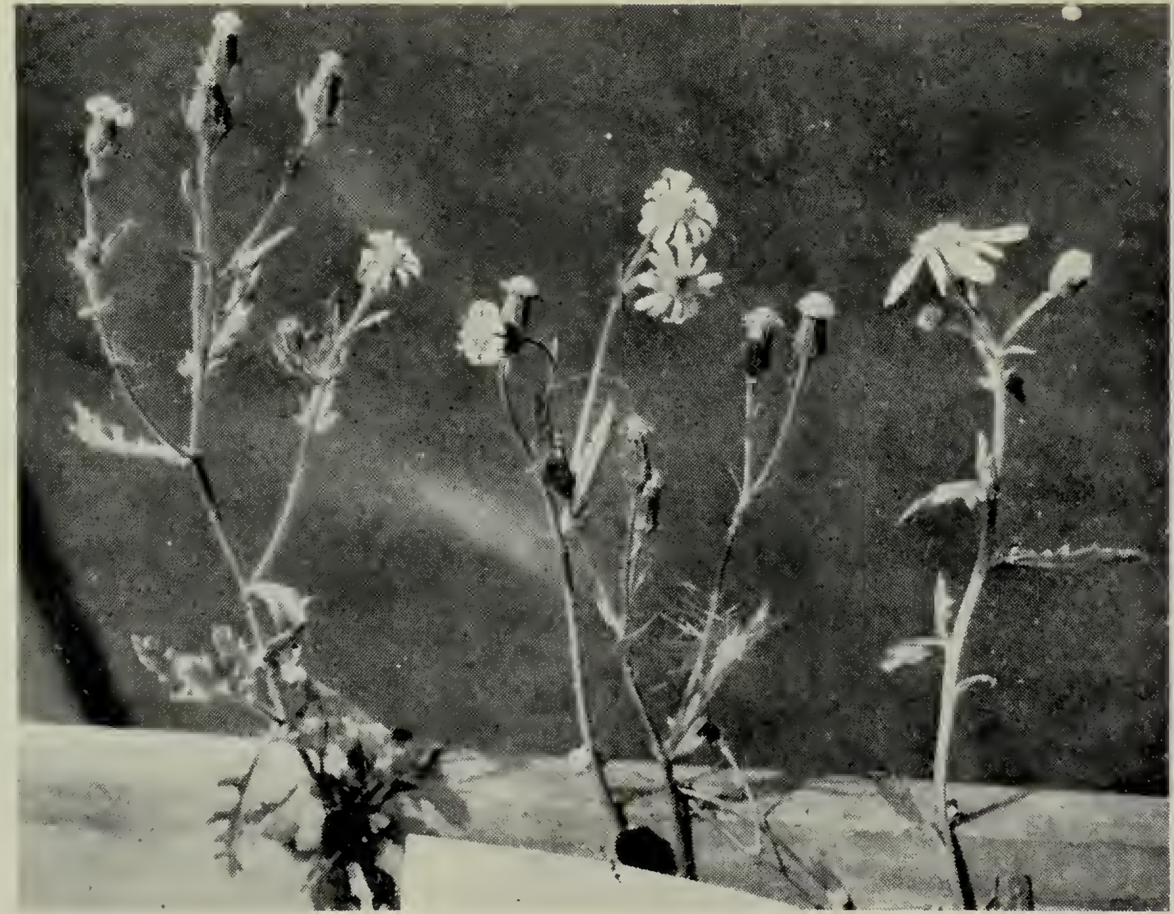
[1] [Less common in north-east London: on a walk from Highgate to Liverpool Street in July 1944 I did not see a single plant.—J. S. L. Gilmour.]

Senecio viscosus L. (1753: *Sp. Pl.*, 868) is usually regarded as a native of coastal and some other parts of Britain, where it has been known since 1660 (Ray, *Cat. Cantab.*, 154). It has long occurred also on waste ground, railway and road-sides and other places where it must be regarded as introduced, and it is often difficult to distinguish between the native and the other habitats. The plant is recorded from most European countries and from Asia Minor and, broadly speaking, it seems to be most frequent and native in Northern Europe from France and Britain through Germany, Denmark and Scandinavia. It is not a common Mediterranean species and would not be likely to be associated with *S. squalidus* under natural conditions.

Viscid Groundsel has long been known as a London plant, having been recorded from Streatham Common in 1763 Martyn, T., *Fl. Cantab.*, 98) but remained for long a rarity as evidenced by the single record as an "accidental waif" in Trimen and Dyer's *Flora of Middlesex*, 1869. Except at a few places such as Ham, where the species was to be regularly found, the plant remained rare in the London area until the present war, though by 1939 there had been a steady increase in frequency all round the suburbs. In Streatham it has occurred at intervals and in varying localities as long as I can remember, and it is possible that it has a continuous existence since 1763, but here, as in central London, the plant had little opportunity to increase in recent years until the air-raid shelters were built in 1939. It has now spread over bombed sites throughout most of London and may fairly be described as common.

In many places in London the two *Senecios* now grow together and in quantity perhaps for the first time in their history and it is well known that when two closely-related species which are naturally isolated by geographical distribution are brought together, hybrids are likely to occur. As a number of hybrids are already known for the genus *Senecio* I started to make a careful search for the hybrid between these two species in the summer of 1944. Early in August a plant was noticed in Lambeth Hill, Queen Victoria Street, with flowers intermediate in size and having narrow ray florets recalling *viscosus*, while the plant was larger and had leaves more like those of *squalidus*. Unfortunately it proved impossible to collect material and although the plant was observed almost daily for some weeks the record of the new hybrid could not be proved. On 19th August another plant believed to be this hybrid was found on the railway sidings at St Mary Cray associated with *viscosus*, but on this occasion other *Senecios* were present and heavy rain discouraged adequate field observations. On 16th September I visited Ham Gravel Pits in the company of Dr Cyril West and here a



Senecio viscosus L. (left). ×*S. londinensis* Lousley (centre). *S. squalidus* L. (right).
All from Baldry Gardens, Streatham, Surrey. September 17, 1944.
× about 4/7th.

From the Trower Fund.

single plant of the hybrid attracted immediate attention amidst abundance of the parents and on this occasion adequate material could be collected. The following morning was devoted to a careful examination of the specimens but it was soon found advisable to obtain further material of the variable *S. squalidus* and I therefore visited a bombed site about a hundred yards from my house at Streatham where I knew both parents were to be found. Here I ventured rather farther from the road than on previous visits and to my astonishment found a fine large plant of an undoubted hybrid. In view of the ease with which fresh material of this plant could be obtained and the very clear evidence it exhibited of both parents, I have used it as the type for the description given below. During the next few weeks examples of the hybrid were found in several places in the City of London, ranging from a plant almost identical with the Streatham example in Aldersgate Street to a rather more common form nearer to *viscosus* as at the site of Sergeant's Inn and Bush Lane, Cannon Street.

The new hybrid is described as follows:—

×**Senecio londinensis** (*S. squalidus* × *S. viscosus*), hybr. nov.

Planta hybrida inter *S. squalidum* et *S. viscosum*, characteres intermedios praebens. Caulis validus, verisimiliter perennis, ut in *S. squalido* laxe ramosus necnon glandulis numerosis viscosis praeditus. Folia inter parentes forma ac textura intermedia, quam in *S. squalido* solet saturatius viridia, supra glandulis, subtus praesertim in costa marginibusque glandulis numerosis viscosis instructa. Capitula magnitudine intermedia (18-20 mm. tota diametro); periclinii squamae glandulis numerosis viscosis vestitae, exteriorae longititude variabiles, usque ad dimidiam longitudinem interiorum, omnes apice nigrae: flosculi radii angusti (<2 mm.), 8-9 mm. longi, lingulati, praesertim post capituli maturitatem quippiam revoluti. Cypselae rugosae et verisimiliter steriles, secundum sulcos ut in *S. squalido* omnino pubescentes sed saturatius coloratae.

Plant a hybrid between *S. squalidus* and *S. viscosus* and intermediate in characters. Stem stout, probably perennial, laxly branched as in *squalidus* with numerous viscid glands. Leaves intermediate between the parents in outline and texture, darker green than is usual in *squalidus*, with glands on the upper surface and numerous viscid glands especially on the mid-rib and margins below. Flowers intermediate in size (18-20 mm. in overall diameter); phyllaries with numerous viscid glands, the outer variable in length up to ½ length of the inner, all with black tips; ray florets narrow (<2 mm.), 8-9 mm. long, lingulate, tending to be revolute especially after maturity of flower. Cypselae shrivelled and probably infertile, uniformly pubescent along the furrows as in *squalidus*, but darker in colour.

Type. Baldry Gardens, Streatham, Surrey, v.-c. 17, 1944, J. E. Lousley in Herb. Mus. Brit. All the specimens distributed under this name from this locality and collected on 17th and 30th September and 6th October 1944 were taken from a single large plant.

The name given to this hybrid has been chosen on account of the special association of the plant with the sites laid bare as a result of German air bombardment in the heart of London.

Distribution:—

16, W. Kent; Railway siding, St Mary Cray, 19th August 1944, J. E. Lousley.

17, Surrey; Ham Gravel Pits, 16th September 1944, J. E. Lousley and C. West; Streatham (as above).

21, Middlesex; Bush Lane, Cannon Street, 7th and 14th October 1944; Sergeants' Inn, 14th October 1944, J. E. Lousley. All above in Herb. Lousley. Also seen at Aldersgate Street. The last three stations are all in the City of London. Mr N. Y. Sandwith has also seen the hybrid at Devereux Court, which is a few yards outside the western City boundary.

The frequency of a hybrid depends on (1) the facility with which the two parents hybridise and (2) the relative rarity of the parents and the frequency with which they are associated. This may be appropriately illustrated by an example from the genus *Rumex* in which *R. conglomeratus* and *R. maritimus* form hybrids abundantly in all the localities where I have seen them associated and yet, owing to the comparative rarity of one of the parents, the hybrid must be regarded as a rarity in Britain generally. The case of the present *Senecio* hybrid appears to be contrary. Both parents occurred in and around London in vast numbers in 1944 and many millions of plants must have been seen, and yet only a small number of individuals of the very easily detected ×*S. londinensis* were observed. At each station where the hybrid was found it occurred only in comparatively small numbers and it would thus appear that the cross does not form very easily. On the other hand, the parents are associated in such large numbers in the London district and in other parts of the country where they are increasing and coming into contact more frequently that it is possible that the hybrid will eventually prove to be widespread.

In its usual forms the hybrid is very easy to detect in the field. On sunny days the dainty star-like appearance of the intermediate-sized flowers with their narrow somewhat revolute ray-florets on a larger, less erect, greener and much more branched plant than *viscosus*, covered with viscid glands, but not " clammy," should at once attract attention in a mixed population, while confirmatory characters will be found in the outer phyllaries and fruits.

After writing the first draft of this paper I heard that Mr N. Y. Sandwith had independently found the hybrid between the same species on the site of Sergeants' Inn in 1943 and again there and by Devereux Court (about 330 yards to the west) and at Ham Gravel Pits in 1944. He kindly read through my draft paper and made a number of valuable suggestions and also showed me the excellent series of specimens he had prepared. A few of Sandwith's observations have been incorporated in the earlier part of this paper, but most of them are given separately below as, with the exception of the Sergeant's Inn specimens (some of which are identical), his forms of the hybrid differ slightly from mine.

He suggests that the peculiar branching of ×*S. londinensis* should be emphasised rather more than it is in my description. In many specimens of the hybrid this is certainly a very striking feature, resulting in large " twiggy " plants with branches widely spreading in all directions and forming almost a small bush. He also points out that the glands are considerably shorter than those of *viscosus* and this I think is probably always true. However, it is very difficult to measure the length of these glands under the microscope without a great deal of preliminary preparation and as their length is variable I prefer not to incorporate the character in my description.

Mr Sandwith also adds some useful contrasting characters in the flowers. He would emphasise that the ligules are intermediate in breadth as well as in length, and this agrees with my own experience and should be implied from the measurement given in my description above. In the Baldry Gardens, Streatham, plant the width of the ligules varied from 1.25 to 1.75 mm., while that of associated *squalidus* and *viscosus* was about 3 and 1 mm. respectively. In my Ham plant the ligules were about 2 mm. broad. He points out that the colour is a greenish-yellow towards that of *viscosus* and very different from the orange-yellow of *squalidus*. This would appear to be the case from my dried material, but as I did not compare the colour of the flowers with a colour-chart when fresh it would be unwise to incorporate the character in my description. As he indicates, there is also a difference in the outer phyllaries, but this is difficult to describe from dried specimens.

Sandwith had the advantage of being able to keep his Sergeant's Inn plants under observation throughout the year and noticed that they were in bloom on 7th May 1944. *S. squalidus* may be found in flower in almost every month of the year but *S. viscosus* does not usually commence to flower until the middle or end of July. If the flowering of the hybrid normally commences at such an early date it should make it especially easy to detect during May and June, for at that time the abundant viscid glands would distinguish it from all other British *Senecios*.

To stimulate further investigation into the hybrids in this genus it may be useful to give a list, together with some references, to those which have already been recorded for Britain. It should, however, be made quite clear that some of these records rest on very inadequate grounds and that further study is desirable in all cases.

3×. *S. aquaticus* Hill × *S. Jacobaea* L.
See Druce in *B.E.C. 1914 Rep.*, 17, 1915, and *1923 Rep.*, 39, 1924, and Praeger in *Journ. Bot.*, *73*, 44, 1935, and *B.E.C. 1935 Rep.*, 137, 1936. This hybrid appears to be common in Ireland and may prove not to be rare in England. [cf. p. 832.—Ed.]

6×. *S. erucifolius* L. × *S. Jacobaea* L.
See Druce in *B.E.C. 1909 Rep.*, 415, 1910. Omitted from *British Plant List ed. 2,* and further study required.

7×. *S. squalidus* L. × *S. vulgaris* L.
This has been recorded on many occasions and the references are too numerous and well known to cite here. Some of them may be incorrectly based on rayed variants of *vulgaris*. It is interesting to note that the plant found by H. J. Howard and E. A. Ellis on Castle Mound, Norwich, and recorded as the hybrid in *Trans. Norf. & Norw. Nat. Soc.* for 1943 is infertile. I have seen specimens in Herb. E. L. Swann.

8×. *S. viscosus* L. × *S. vulgaris* L.
Recorded with some doubt by Riddelsdell in *Journ. Bot.*, *61*, 176, 1923. I gathered a plant in my own garden on 28th August 1942 which I believe to be this hybrid as the characters are mixed, but it may be only a luxuriant, less glandular form of *viscosus*. The hybrid is known in Sweden.

9×. *S. sylvaticus* L. × *S. viscosus* L.
See Amphlett & Rea, *Fl. Worcs.*, 206, 1909, and *B.E.C. 1909 Rep.*, 415, 1910. Further investigation is required but this is a well-known hybrid in Europe.

31×. *S. Cineraria* DC. × *S. Jacobaea* L.
A very distinct and convincing hybrid which has been found in a number of places in England and Ireland and is well known.

Finally, I wish to express my thanks to the various friends mentioned in this paper for their assistance and especially to Mr N. Y. Sandwith for his very generous co-operation in placing his specimens and observations at my disposal.

THE FLORA OF BOMBED SITES IN THE CITY OF LONDON IN 1944.

J. EDWARD LOUSLEY.

The pioneer flora of the areas laid waste by enemy action in and around the City of London has already been described (Lousley in *B.E.C. 1941/2 Rep.*, 528-531, 1944), and the purpose of the present paper is to record the further development up to the autumn of 1944. Continued clearance of the sites and the constant influx of additional species has so greatly increased the material available for study that it has proved advisable to restrict the present account to the area within the political boundaries of the City of London Corporation, whereas in the former paper a number of records were included from beyond these limits.

The area of the City of London is about 673 acres, and it is one of the most congested built-up areas in the world. The sites of most of the buildings now destroyed have been covered for a very long period. Thus the ground occupied by the Temple Church has been built on since at least 1185, and that of St Olave, Hart Street, certainly since 1222 and possibly since before the Norman Conquest. With the exception of brief periods for rebuilding, some of the sites now exposed to the foundations may have been continuously roofed over since Roman times, and one must go back to the years immediately following the Great Fire for the last opportunity of doing any extensive botanising within the confines of the City. It is therefore disappointing to record that the almost unique opportunity of studying the recolonisation of a British area which was botanically almost completely sterile has to a considerable extent been spoiled by the misguided efforts of well-meaning enthusiasts who have sown the seeds of garden plants broadcast in order to " beautify " the ruins. Every observant gardener will be well aware of the surprising amount of adventitious weed seed which is often contained in packets of flower seed purchased from even the best of seedsmen and it is patent that this broadcast sowing must have introduced species which otherwise might not have occurred. The behaviour of the garden annuals (and biennials) deliberately sown has varied but a number of them are certainly reproducing from their own seed and are likely to hold their own for a period until the competition of wild species becomes too strong. These which seem certain to persist for a while include *Calendula officinalis, Antirrhinum majus, Alyssum maritimum* and *Oenothera sp.*

The majority of the records given in this paper were made during a series of special visits planned to cover the whole of the area in September and October 1944. To this have been added many casual observations made in the course of my daily peregrinations about the City throughout the year, and also a number of notes sent to me by friends whose names are included in the individual records. It should, however, be made clear that although the list is believed to be fairly complete as regards the plants recognisable in autumn it may well be less satisfactory as regards the earlier flowers. The boundaries and street names adopted are those shown on the " Geographia " fifteen inches to the mile map of the City of London (undated, but purchased direct from the publishers in 1944) in which no inaccuracies have been detected.

The following is the list of species observed during 1943 and 1944:—

6/3. Ranunculus acris L. Churchyard of St Olave, Silver Street, W. J. L. Sladen and D. McClintock.

6/5. Ranunculus bulbosus L. Between Queen Victoria Street and Upper Thames Street, W. J. L. Sladen. No specimen was preserved but the finder is confident that this was the species found.

†13/3. Delphinium Gayanum Wilmott. Basinghall Street, W. J. L. Sladen and D. McClintock.

†21/1. Papaver somniferum L. Not uncommon and often as hortal colour forms. Deliberately introduced.

†28/1. Eschscholzia Douglasii Walp. Newgate Street—deliberately introduced.

†34/1. Cheiranthus Cheiri L. Old Bailey—deliberately introduced.

35/4. Rorippa islandica (Oeder) Borbás. Warwick Lane, in fair quantity.

†42/10. Alyssum maritimum Lam. Frequent, and doubtless deliberately introduced. Sometimes, as at Walbrook, with mauve-tinted flowers.

†47/2. Hesperis matronalis L. Between Silver Street and Cheapside, W. J. L. Sladen and D. McClintock.

†49/3. Sisymbrium altissimum L. Occasional.

†49/4. Sisymbrium orientale L. Frequent.

(49/5. Sisymbrium Irio L. So far as I am aware there is no authentic record of this species having reappeared in the City, although there have been a number of apparently ill-informed newspaper pronouncements to this effect. The hunt was on when the *Daily Mail* on 23rd February 1943 exhorted its readers to " Watch for Fire Flower " and to help them in their quest described it as " a whitish flower, and the plant is from 18 in. to 2 ft. tall" ! Most of the records which have been made seem to have been based on specimens of *Sisymbrium altissimum* and *S. orientale,* which run down to *S. Irio* in some of the floras in common use in which these two increasing aliens are omitted. Although the London Rocket has a place in our Floras which has become hallowed by botanical antiquity, it is as well to remember that its abundance on the ruins of London in 1667 and 1668 was in circumstances very similar to those which its two allies now enjoy and that it was then probably introduced from Europe and was as much an alien then as they are now.)

50/1. ERYSIMUM CHEIRANTHOIDES L. Very local—only seen at Brook's Wharf.

†54/2. BRASSICA CAMPESTRIS L. Occasional and usually near roads.

55/1. DIPLOTAXIS TENUIFOLIA (L.) DC. In quantity over a limited area on both sides of Upper Thames Street from Darkhorse Lane to near Bush Lane; rare by Dean Street, Chancery Lane. This species was first recorded for Britain from London by Gerard (*Herbal*, 192, 1597) and the works of the older botanists contain frequent reference to its occurrence in quantity on London Wall and elsewhere in the City, including London Bridge. In view of its abundance and persistence it was a much more representative plant of the City flora than *S. Irio*, and it would be tempting to make out a case for its reappearance being due to long buried seed being brought to the surface. The main centre of its present distribution, however, is near Cannon Street Station and it is likely that it has been brought up in some way by activities connected with the railway from the trackside at New Cross or beyond in Kent, where it is abundant.

59/1. CAPSELLA BURSA-PASTORIS (L.) Medik. Frequent.

60/2. CORONOPUS PROCUMBENS Gilib. Only seen in one place; in Redcross Street.

†95/1. SAPONARIA OFFICINALIS L. Well established between Well Street and Monkwell Street (where it may have originated from a disused churchyard) and on brick rubble on the corner of Wood Street and Addle Street.

98/3. LYCHNIS ALBA Mill. Bush Lane and Neville Court.

100/5. CERASTIUM VULGATUM L. Frequent.

101/3. STELLARIA MEDIA Vill. Common

102/5. ARENARIA SERPYLLIFOLIA L. Near Cannon Street Station, W. J. L. Sladen.

†115/3. ALTHAEA ROSEA L. West Smithfield and King William Street.

†135(2)/1. AILANTHUS ALTISSIMA (Mill.) Swingle. As seedlings and saplings plentiful in the basements of bombed buildings in the Temple.

153/7. MEDICAGO LUPULINA L. Rather uncommon.

154/1. MELILOTUS ALTISSIMA Thuill. Basinghall Street. W. J. L. Sladen and D. McClintock.

†154/3. MELILOTUS ARVENSIS Wallr. Two fine plants by Mark Lane.

155/2. TRIFOLIUM PRATENSE L. Common.

155/15. TRIFOLIUM HYBRIDUM L. Rather uncommon.

155/16. TRIFOLIUM REPENS L. Rather rare.

220/1. EPILOBIUM ANGUSTIFOLIUM L. In the greatest abundance throughout the City and usually the first flowering plant to invade blitzed sites. Frequently to be seen also on the top of Police Boxes, Home Guard Blockhouses, etc., wherever a little sand or soil has collected.

220/8. Epilobium roseum Schreber. Near the Tower of London on the City boundary.

220/10. Epilobium montanum L. Churchyard of St Giles, Cripplegate.

†223/. Oenothera sp. ("Evening Primrose"). In several places.

†250/3. Petroselinum crispum (Mill.) Nym. Between Queen Victoria Street and Upper Thames Street, W. J. L. Sladen.

†276/4. Peucedanum graveolens (L.) Druce. Great Tower Street.

287/1. Sambucus nigra L. Common, though often only as seedlings. Introduced by the agency of birds.

†320/3. Erigeron canadensis L. In the greatest abundance throughout the City. This is a North American species first recorded as a British species by Ray (*Syn.*, 49, 1690) as found by Dr Tancred Robinson about London "*sed certe non indigena*" (misquoted in *Comital Flora*).

†347/4. Helianthus annuus L. Mark Lane and Upper Thames Street.

†352(2)/1. Cosmos bipinnatus Cav. West Smithfield.

354/1. Galinsoga parviflora Cav. Very local. Neville Court, by Temple Church, by St Dunstan's-in-the-East, Redcross Street, and in 1942 in Fenchurch Street. This species prefers garden soil, which is scarce in the City.

365/1. Achillea Millefolium L. Rather rare and usually in places where grasses have grown to form a "turf."

†368/1. Anthemis tinctoria L. Churchyard of St Olave, Silver Street, W. J. L. Sladen and D. McClintock.

368/4. Anthemis Cotula L. Basinghall Street, W. J. L. Sladen and D. McClintock.

†370/13. Chrysanthemum Parthenium (L.) Bernh. forma hortense (Schur) Beck. King William Street.

371/1. Matricaria inodora L. Very common.

†371/3. Matricaria matricarioides (Lessing) Porter. Very rare—Dean Street.

378/3. Artemisia vulgaris L. Common.

379/1. Tussilago Farfara L. Abundant.

†383/7. Senecio squalidus L. Most abundant and variable. The rapid increase of this species in the City (as elsewhere in London) during the past two years is remarkable.

383/7×. Senecio squalidus L. × viscosus L. (×S. londinensis Lousley). See separate paper in this Report.

383/8. Senecio viscosus L. In quantity and widespread though not quite as abundant as the last species.

383/10. Senecio vulgaris L. Frequent. The var. *radiatus* Koch was found near Wood Street by W. J. L. Sladen and D. McClintock.

†385/1. Calendula officinalis L. Very common and widespread and apparently naturalised.

396/2. Cirsium vulgare (Savi) Airy-Shaw. Rare. Between Well Street and Monkwell Street, Bush Lane, Neville Court. Known by St Alphage, London Wall, since before the present war.

396/8. Cirsium arvense (L.) Scop. Common. Occurred on a Houndsditch site before the war.

421/2. Hypochaeris radicata L. Churchyard of St Giles, Cripplegate.

423/. Taraxacum officinale Weber. Rare. Billiter Square and St Paul's Churchyard.

†425/2. Lactuca Serriola L. Uncommon. Aldersgate Street, Cannon Street (Western end) and by St Dunstans-in-the-East.

427/2. Sonchus arvensis L. Between Silver Street and Cheapside, W. J. L. Sladen and D. McClintock.

427/4. Sonchus oleraceus L. Very common. Occurred in Houndsditch before the present war.

†474/3. Buddleia variabilis Linde. Locally common about St Paul's Cathedral, as in Cannon Street, Carter Street, Newgate Street, Paternoster Row, and a little farther away at Brook's Wharf. Undoubtedly these plants, some of which have now attained flowering size, have originated from seed blown from planted shrubs in the Cathedral churchyard.

513/1. Convolvulus arvensis L. Very rare—Neville Court.

†516/1. Solanum Lycopersicum L. Occasional. Apparently growing from seed from tomatoes thrown away by people having "packed lunches" the previous year.

†517/10. Solanum tuberosum L. Seen in several places.

517/2. Solanum nigrum L. Common.

†532/2. Linaria purpurea Mill. Frequent, and likely to thrive.

†534/1. Antirrhinum majus L. Common.

577/3. Stachys sylvatica L. Near Goldsmith's Hall. W. J. L. Sladen and D. McClintock.

(583/1. Ballota nigra L. Seen only at Trinity Square a few yards outside the City boundary.)

588/8. Plantago lanceolata L. Rare. Old Swan Lane. Also seen in the churchyard of St Olave, Silver Street, by W. J. L. Sladen and D. McClintock.

588/10. Plantago major L. Rare. Billiter Square and Dean Street.

†596/6. Amaranthus retroflexus L. Great Tower Street and Lower Thames Street.

600/1. Chenopodium rubrum L. Rather common as at Monument Street. Bush Lane, Upper Thames Street, Mark Lane and Hart Street near St Giles. Cripplegate. This species would appear to be increasing rather rapidly in central London on bombed sites. In the country around London it is quite common.

(600/6. Chenopodium murale L. Seen by Mr N. Y. Sandwith in 1943 and 1944 in Devereux Court a few yards west of the City boundary.)

600/8. Chenopodium album L. Common.

600/15. Chenopodium polyspermum L. Very rare—seen only at Aldermanbury.

606/3. Atriplex patula L. Uncommon.

606/5. Atriplex hastata L. Common.

†613/3. Salsola pestifer Nelson. Mark Lane and Lower Thames Street—at the last locality on disintegrating sandbanks. I have used Nelson's name for this plant because his description in Coulter and Nelson's *New Manual of Botany of the Central Rocky Mountains*, 1909, page 169, is clear and unambiguous, and there would seem no reason to doubt that he describes the species found here. This contention is supported by the illustration in Britton and Brown's *Illustrated Flora of the Northern States and Canada*, ed. 2, *2*, 25, 1913, fig. 1714. Nelson's is almost certainly not the earliest name for the plant and I use it because war-time conditions make impossible the reference to rare books and continental material necessary to fix the nomenclature. The species is probably a native of Southern Russia, whence it has spread throughout most of Europe and to North America, where it is a great pest under the name of Russian Thistle. For the most part it is the plant referred to in British literature as *Salsola Kali* var. *tenuifolia* Tausch and *Salsola Tragus* L., and it is an increasingly frequent alien of docks, rubbish-dumps, waste ground and even arable fields. At Dagenham it has been established for at least 20 years and now covers the dumps in vast quantity—in some places to the almost total exclusion of other vegetation. The railway which passes near to the Dagenham habitat runs into Fenchurch Street Station close to the City habitats of *S. pestifer*, and goods traffic may possibly account for its introduction.

615/2. Polygonum Convolvulus L. Uncommon—Long Lane, Wood Street, and Great Tower Street.

615/6. Polygonum lapathifolium L. Bush Lane and Aldermanbury Postern.

615/7. Polygonum Persicaria L. Common.

615/14. Polygonum heterophyllum Lindm. Common.

†615/32. Polygonum Sieboldii De Vriese. Well Street.

618/3. Rumex crispus L. Occasional.

618/6. Rumex obtusifolius L. ssp. agrestis (Fries) Danser. Frequent.

618/9. Rumex conglomeratus Murr. Very rare—one plant only seen in Bush Lane.

618/8. **Rumex sanguineus** L. var. **viridis** Sibth. Very rare—Friday Street.

(628/14. **Euphorbia Peplus** L. Occurs on Tower Hill just outside City boundary.)

632/2. **Mercurialis annua** L. Rare—Redcross Street, Hart Street, Queen Victoria Street, and Knightrider Street.

633/. **Ulmus** sp. A large Elm tree in Queen Street was broken off a few feet above the ground by a Flying Bomb during the summer but although the short remaining trunk was badly split and lost most of its bark a few leaves were put out in November 1944.

637/1. **Urtica dioica** L. Frequent.

638/1. **Parietaria diffusa** M. & K. Since before the present war this plant has flourished on the short stretch of exposed " Roman Wall " by St Alphage. It has now spread in considerable quantity to brick rubble near Aldermanbury Postern and may thus properly be included in a list of the plants of the bombed sites.

†640(2)/1. **Platanus acerifolia** Willd. Many seedlings and saplings up to a metre in height in the exposed basements of buildings in the Temple.

642/1. **Betula alba** L. Seedlings recorded from between Queen Victoria Street and Upper Thames Street, W. J. L. Sladen.

650. **Salix**. Specimens of each of the plants I understand by the following names from the City bombed sites have been seen by Mr A. Bruce Jackson, who considers them correctly named:

650/6. **Salix viminalis** L. Rare. New Basinghall Street and the Temple.

650/8. **Salix Caprea** L. Very common, and occurring throughout the area. The plants are at present (January 1945) commonly 5 feet in height, and occasionally taller, as in the Temple, where there are bushes attaining 10 feet.

650/10. **Salix atrocinerea** Brot. Less common than the last species, but not rare. All three Willows at times grow on the tops of truncated walls.

770/3. **Alopecurus myosuroides** Huds. Churchyard, St Olave, Silver Street, W. J. L. Sladen and D. McClintock.

777/1. **Phleum pratense** L. Uncommon—specimens from Friday Street have been confirmed by Mr C. E. Hubbard.

780/. **Agrostis gigantea** Roth. Frequent. Specimens from Jewin Street and Fetter Lane determined by Mr C. E. Hubbard.

792/1. **Holcus mollis** L. Rare—Billiter Square.

†794/7. **Avena sativa** L. Rather common.

808/2. **Cynosurus cristatus** L. Churchyard, St Olave, Silver Street, W. J. L. Sladen and D. McClintock.

819/1. **Dactylis glomerata** L. Common.

824/14. **Poa annua** L. Frequent.

827/3. Bromus sterilis L. Churchyard, St Olave, Silver Street, W. J. L. Sladen and D. McClintock.

829/1. Lolium perenne L. Very common.

†829/4. Lolium multiflorum Lam. Occasional.

835/2. Hordeum murinum L. Rare—Wood Street and Minories.

†835/10. Hordeum vulgare L. Ocasional.

847/1. Pteridium aquilinum (L.) Kuhn. Very abundant throughout the City, especially in basements which have been exposed and not filled in. Even before the present war it was to be seen in Houndsditch (Lousley in *Journ. Bot.*, 1939, 181), on the remains of a building demolished to ground level, and I understand that it also occurred in several places in gloomy basement areas. In 1943 young Bracken plants were to be seen scattered about the City, but it was not until 1944 that the fern could be said to be abundant. The favourite habitat is in the exposed basements of buildings which have been demolished to ground level, and there can be no possible doubt that it has originated from wind-borne spores. Even if fragments of rhizomes were occasionally brought in by some means the growing plants could seldom penetrate the thick walls between the basements and hence it is clear that the present abundance is due to thousands of separate introductions which could not be otherwise than by spores. Parts of the basements are damp and sheltered from the wind and the sun and it seems that such conditions favour the germination of the spores and development of the prothalli. But the occurrence of bracken is not limited to the basements. Near the Coal Exchange in Lower Thames Street in a shaded corner the brickwork of a wall is kept perpetually damp by a leaky pipe or gutter above, and here juvenile Bracken plants about 3 inches long may be seen five feet above the street level. In Allhallows Lane at the side of Cannon Street Station there is a series of waste pipes descending from the Station above, and in the cup formed by the jointing of one of these pipes healthy Bracken plants grow some 15 feet above the road. In such places introduction could only be by spores and it seems likely that these are present in the City air in great quantity but only occasionally find suitable places for development.

856/1. Dryopteris Filix-Mas (L.) Schott. Seen near old disused churchyards in Upper Thames Street, Well Street, and St Giles, Cripplegate, where it is likely to have been introduced, but rarely elsewhere as in Snow Hill in basements apparently originating from spores.

Throughout the above list all plants believed to have been deliberately introduced, such as shrubs planted in churchyards and flowers and vegetables on little corners of rubble temporarily cultivated, have been excluded, but garden flowers occurring haphazardly on the rubble are included as it is impossible to distinguish between those self-sown and the work of enthusiasts broadcasting seed.

In this list there are records of 112 species and one hybrid, whereas in my previous paper, which recorded the position at the end of 1942, only 27 species could be given—and not all of these had then been seen within the area to which the present account is restricted. As might be expected from the greater distance from gardens and parks, the flora of the bombed sites in the City is still less rich than that of the West End, but the increase in the course of the two years is of interest. Species with wind-borne seeds still predominate, though even here there has been some change in proportions and *S. vulgaris* is no longer the most abundant *Senecio*. The greatest increase has been in the weeds of cultivation, which have probably been brought on the wheels of vehicles and on the boots of workmen and to a lesser extent on the clothing of the many City workers who travel up daily from the country. Some cultivated grasses and clovers have probably originated from horse's nosebags, while packing materials furtively disposed of in spite of the vigilance of the police may be responsible for other introductions, especially in the warehouse districts.

Between 1942 and 1944 the greatest change has been in the rapid increase of the dominant species: *Epilobium angustifolium*, *Erigeron canadensis*, *Tussilago Farfara*, *Senecio squalidus*, *S. viscosus*, *Sonchus oleraceus* and *Pteridium aquilinum* amongst the herbs, and *Sambucus nigra* and the *Salices* amongst the shrubs. Where the sites are left undisturbed the present phase is likely to come to an end and, at least in the exposed basements, the Bracken may gain absolute dominance. Where there is a certain amount of disturbance the present species may continue to thrive, as also will some at least of the introduced garden plants such as *Alyssum*, *Antirrhinum*, *Calendula*, and perhaps others.

Finally, I wish to acknowledge my indebtedness to Miss L. J. Johns and Messrs W. J. L. Sladen, D. McClintock, and N. Y. Sandwith for records of plants observed by them.

BIBLIOGRAPHICAL NOTES AND REVIEWS.

"The 'Tunbridge Wells' Botanical Pocket Book." The authorship of this rare work, published at Tunbridge Wells by J. Clifford in 1840, is discussed by J. S. L. Gilmour and H. S. Marshall (1944: *J.B.*, *80*, 132-134), who give evidence to refute its attribution to either T. F. Forster or T. I. M. Forster, and conclude that it was compiled by the publisher.—[Wi.]

Dream Island Days. R. M. Lockley. Pp. 144. London: H. F. & G. Witherby, Ltd., 1943.

This very readable book gives an exciting account of the adventures of the author, who is well known for his ornithological studies, and who made his home from 1927 to 1940 on the island of Skokholm. This lonely island is situated about two miles off the Pembrokeshire coast and the flora belongs to v.-c. 45. Lockley's story contains many descriptions of the plants of various habitats, but the chief botanical interest in the book rests on the list of 176 plants recorded from this mile-long island by the author's wife, who doubtless had the assistance of visitors. There is a close resemblance between the list of native species and those of the uninhabited islands of the Scillies. *Stellaria nemorum* is doubtless an error, and *Potentilla verna*, *Veronica agrestis* and *Lepturus incurvatus* require confirmation, but the list should be useful to Welsh botanists, and there is also mention of some plants from Grassholm and the "Bishop and Clerks" rocks.

J. E. Lousley.

British Botanists. By John Gilmour. London: William Collins, pp. 48, with 8 plates in colour and 19 other illustrations, 1944; 4/6.

This inexpensive addition to the botanist's library is well worth its price for the illustrations alone, as befits a member of the series "Britain in Pictures." To deal satisfactorily with British botanists of some 350 years in 34 pages of printed matter is, however, impossible, and the author himself calls his work "not a continuous story of British botany; rather a few selected scenes strung together on a thin historical thread." It is, indeed, too much botany, and too little botanists, though the distinction is inevitably a matter of emphasis, for a history of botanists involves the development of their science. Although there is much that one can criticise, there is also much to enjoy, and much "food for thought," even if that is not the primary object indicated by the title, which indicates a book which will give the general reader, for whom the series is produced, a sound outline of the country's production of botanists.

The account of pre-Linnean botanists is more satisfactory than that of those who followed the great Swede who revolutionised botany, but even so, the space devoted to the outstanding figures entails the omission of the parts played by so many good botanists—Dale, Llwyd, Petiver, Sherard, etc., and even Sloane, whose *Hortus Siccus* was the finest in the world, not to mention those who explored distant lands and brought back, like Cunningham from China, the first-known specimens from distant lands. Post-Linnean British botanists who continued these explorations and often provided the material for those who worked at home also deserve some mention, and again enlargement on the few prevents a proper balance being obtained. One paragraph should have been given to those who, in the second half of last century, " made Britain the best botanized country in the world," for example Babington, Boswell-Syme, the coterie of Reverend gentlemen, Ley, Purchas, Marshall, the Lintons, Rogers, etc. Scotland is rather scurvily treated (p. 34): one misses Sibbald, Lightfoot, Dickson, and others. The most serious omission to my mind is that of F. F. Blackman (admittedly alive, but so are Biffen and Tansley), whose work on plant physiology was outstanding and whose " Optima and Limiting factors" marked a revolution in thought. But it is easy to criticise and in such limited space a more complete account might have become unreadable. As it is, there is much to interest any reader, including the botanists themselves. It is a pity that the writing was not given more polish to match the beautiful illustrations; some phrases seem very out of place beside them. But nobody is likely to regret having purchased a copy.

A. J. WILMOTT.

ABSTRACTS FROM LITERATURE.

[Those responsible for these Abstracts are indicated as follows:—[H.]=H. A. Hyde; [Wa.]=A. E. Wade; [Wi.]=A. J. Wilmott.

When only one entry is made in this Report from a single paper the full reference is given with the entry, in order to avoid both unnecessary printing and cross-reference: the usual method of citation by reference to the Bibliography is retained when more than one reference is made to the same paper.

Note to Contributors It would be a great convenience to the Editors if contributors would send in their Abstracts, and any necessary References for the Bibliography, on slips of uniform size, the size desired being 8 inches by 5 inches, the long edge to be treated as the top of the page. A separate slip for each item permits the easy sorting of the MS. without the transcription which is otherwise too often necessary in the preparation of copy for the printer. The uniform slips can be easily filed and will be available for future reference, thus enabling the Editors to avoid repetition and to make helpful references to previous notes.—Ed.]

GENERAL.

(A) BIOLOGY AND MORPHOLOGY.

Atmospheric Pollen.—Hyde, H. A., and Williams, D.A. (1944: Studies in Atmospheric Pollen; I, A Daily Census of Pollens at Cardiff, 1942; *New Phyt.*, *43*, 49-61) exposed microscope-slides coated with an adhesive and changed every 24 hours during the whole of 1942 and subsequently analysed the pollens so obtained. They found that anemophilous pollens formed 93.5% of the 15,673 grains identified and entomophilous pollens 6.5%. The effective pollen season lasted from early March until late September; there were three phases: (a) trees, (b) grasses, (c) dicotyledonous herbs. The following highest counts (on 5 sq. cm.) were obtained on the dates stated: *Corylus*, 63 on 20th March; *Alnus*, 29 on 25th March; *Taxus*, 142 on 26th March; *Salix*, 10 on 27th April; *Ulmus*, 107 on 1st April; *Populus*, 6 on 13th April; *Fraxinus*, 12 on 11th April; *Betula*, 387 on 27th April; *Carpinus*, 21 on 28th April; *Fagus*, 20 on 9th May; *Pinus*, 23 on 27th May; *Quercus*, 103 on 16th May; *Gramineae*, 482 on 23rd June; *Plantago*, 28 on 6th June; *Rumex*, 14 on 8th June; *Urtica*, 58 on 19th June. The great majority of entomophilous pollens caught belonged to flowers with exposed (Knuth's type E) or partly concealed (EC) nectar or to pollen flowers (Po), the most numerous being Ranunculaceae, Cruciferae, Umbelliferae, *Sambucus* and Compositae. No type of pollen was caught which could not have originated within a few miles at most and there appeared to be a high correlation between the pollen composition of the catch and that of the local vegetation, though distant transport could not be excluded. There was also a close relation between the catch and local weather conditions.—[H.]

Hyde, H. A. (1944: Pollen Analysis and the Museums; *Museums Journal, 44*, 145-149) describes the scope of *palynology*, the new branch of knowledge, centred on the technique of pollen analysis, which has recently come into being, and pleads for the help of the museums in developing it.—[H.]

Hyde, H. A., and Williams, D.A.—1943: A Census of Atmospheric Pollen; *Nature, 151*, 82-3. Preliminary note.—[H.]

POLLEN.—Lewis, D., and La Cour, L. F. (1944: *Nature, 153*, 167-8) describe a method of collecting pollens in quantity, based on air suction. —[H.]

INTERRELATIONS OF PLANTS AND INSECTS formed the subject of a joint discussion held between the British Ecological Society and the Royal Entomological Society of London (Anon.; 1944: *Nature, 153*, 424-6). —[H.]

NECTAR, POLLEN AND HONEY.—J. Pryce-Jones (1944: *P.L.S., Sess. 155*, 129-174) discusses in detail problems connected with these in the "bee-flower relationship," many British species being mentioned.

SEED DISPERSAL.—Healey, A. J. (1943: *Nature, 151*, 140) describes some observations on accidental carriage and dispersal of seeds caught on human clothing.—[H.]

GERMINATION OF SEEDS.—An account of recent work is given by Tincker, M. A. H. (1943: *P.L.S., Sess. 154*, 167-182, with discussion 182-184). The longevity of seeds can often be increased by suitable storage conditions. *Oenothera biennis, Silene noctiflora, Verbascum Blattaria*, and *Rumex crispus* germinated after 60 years in bottles buried 18 inches in soil in Michigan. Low temperature and low humidity generally favour longevity. Hard seed coats which become impervious to water are a well known cause of dormancy: various methods of inducing subsequent germination are described. Some seeds germinate better in the light, others better in darkness. Certain wave-lengths of light may inhibit or stimulate germination. The effects of many other factors is discussed and a long bibliography is given. In the discussion Dr Ramsbottom mentioned that *Albizzia Julibrissin* seeds in the British Museum collections, brought from China in 1793, germinated in their box in 1940 after wetting during the extinguishing of a fire, which led him successfully to attempt the germination of seeds of *Nelumbium Nelumbo*, both from Manchurian peat estimated as at least 300 to 400 years old brought to London in 1926, and from a receptacle in the Sloane collections, estimated as at least 250 years old, some of which were germinated by Robert Brown a century ago.—[Wi.]

PHENOLOGY.—Phenological reports for 1943, based on observations by members of the Darlington and Teesdale Naturalists' Field Club, are published in the *N.W. Nat., 18*, 350-351 (1943).—[Wa.]

FLOWERING.—J. McLean Thompson (1944: *P.L.S., Sess. 156*, 46-68, and discussion) makes suggestions "Towards a modern physiological interpretation of flowering." As a study of cauliflorous plants, in which the inflorescences spring direct from woody branches, makes it "increasingly evident that *either* a foliar *or* a flowering shoot may be developed from an exogenous or an endogenous meristem and that reversion of state is oft-recurrent, questions have grown more insistent as to what may be the factors which determine this or that course of development within a shoot, as to which are major factors, and as to where they reside. The time has not yet come when final and well-balanced answers can be given." But detailed observations on the course of development of form and organisation are given which may help towards an elucidation of the problem.—[Wi.]

Bulbs and Corms.—Priestley, J. H., and Scott, Lorna I. (1943: Notes from a Botanical Laboratory; *Naturalist*, No. 805, 33-37) discuss the formation of bulbs and corms in monocotyledons and give a detailed account of the structure and development of the bulb of the bluebell and the corm of the crocus.—[Wa.]

Heterostylism.—Lewis, D. (1943: The Physiology of Incompatibility in Plants, II; *Ann. Bot., N.S.*, *7*, 115-122) has discovered that differences in the osmotic pressure of styles and pollen of thrum- and pin-plants of *Linum grandiflorum* will account for the fact that pin-flowered plants are not usually fertilized by pin-flowers nor thrum by thrum.—[H.]

(B) ECOLOGY.

Forestry.—The report of a joint meeting between the British Ecological Society and the forestry societies of Great Britain to discuss the "Ecological Principles involved in the Practice of Forestry" is published in *Forestry, 17*, 11-46, 1943, and also in the *Journal of Ecology*, *32*, 83-115, 1944.—[Wa.]

Aquatic Vegetation.—Grose, J. D. (1943: The Changing Vegetation of Coate Water; *Wilts. Arch. and N.H. Mag.*, *50*, 269-270) gives some observations made during the years 1934-1940 on the changing frequency of five species at Coate Water, an artificial lake. With one exception all the species mentioned are now scarce although each has occurred in abundance in one or more years during the period.—[Wa.] See also Grose, J. D. (1944: *J.B.*, *80*, 125-126).

Sea Cliffs.—Hepburn (1943) gives an account of the vegetation of sea cliffs between Trebetherick Point and Kellan Head, North Cornwall. It is shown that only a small community of plants can survive exposure to wind and spray on the lower cliffs. On the higher parts with more soil and less exposure to spray other plants occur along with those of the lower zone, but with the latter in different relative quantities. Very few of the true cliff plants are able to compete with the grasses and other plants of the grassland community on the cliff tops. Cliff-walls bordering the cliff grassland support a flora which includes a number of true cliff species.—[Wa.]

Salt Marsh.—Boley, M. B. (1943: The Vegetation of Berrow, North Somerset; 1, The Salt Marsh Community; *Proc. Bristol N.S.*, *9*, 427-433) gives an account of the salt marsh vegetation at Berrow and discusses the changes which have taken place since 1922. Changes in drainage and silting leading to altered levels and salinity have been the chief factors in the changes. A list of species with their frequencies in 1922, 1930 and 1942 is given.—[Wa.]

SAND DUNES.—Boley, G. M. (1944: The Vegetation of Berrow, North Somerset; 2, The Sand Dune Succession; *Proc. Bristol N.S.*, *9*, 510-520) describes the flora of the foreshore and sand-dune communities at Berrow and compares the observations of previous workers. A full list of species is given with their comparative frequencies in the years 1906, 1922, 1929 and 1943.—[Wa.]

EFFECT OF WIND-BLOWN SEA SALT ON PLANTS.—Edlin, H. L. (1943: Salt Storm on the South Coast; *Quart. Journ. For.*, *37*, 24-26) records damage done to forest trees in the south of England in the spring of 1942.—[H.]

THE IMPACT OF WAR ON THE BRITISH FLORA.—An excellent summary for Wiltshire has been given by J. D. Grose (1944: *Wilts. Arch. and N.H.M.*, *50*, 336-345), and it is to be hoped that other local botanists will similarly set down changes observed in their own areas, for the benefit of future students. The felling of woodlands may permit the reappearance of members of the ground flora, but if the sites are colonised by bracken or replanted by conifers the result will be a serious impoverishment of our flora. A good deal of the ploughing up of poor heath land and other areas has resulted in little if any gain to the war larder and much destruction of natural amenities.

Many weeds have flourished and spread. The considerable cultivation of flax has made *Linum usitatissimum* once again a frequently observed casual. The roadside borders have escaped the extreme cutting that in pre-war years was destroying one of the great pleasures of the countryside for little if any benefit to the farmer, whose weeds rarely came from either roadside or hedgebank, but more often found it difficult to exist in such densely populated habitats.

Tank practice has produced many areas suitable for ecological studies in recolonisation.

Air-raid shelters have produced many crops of unusual weeds, and bombed sites yet others. The spread of *Senecio squalidus* L. may have been partly due to the wide range of the London Fire Brigade, but some places (Canterbury, I am informed) seem to have escaped it: full records for this species might be of interest.

Decreasing transport facilities have given our rarities a chance to recover, as happened to some in the last war. The collection of medicinal herbs and rose-hips is not likely to have affected the flora permanently. Many defence trenches have provided increased habitats for water plants.

Most of the effects would probably disappear after a few years of normal conditions, but the extent to which this is true can only be judged if the effects of war are set down now. Mr Grose's article is a valuable contribution to the history of our flora, and a model for others to study.—A. J. WILMOTT.

C. I. Sandwith (1944: *Proc. Bristol N.S., Ser. 4, 9*, 471) writes:—"The aspect of the countryside has been somewhat changed by war needs, waving corn, with the accompanying cornfield weeds, Red Poppies, Corn Chamomile and others not commonly seen in this part of the district, taking the place of well known, green pastures."

Bombed Areas.—Salisbury (1943) describes the colonization of bombed areas in London and discusses the ecological factors involved. The principal species concerned are *Epilobium angustifolium*, *Senecio vulgaris*, *S. squalidus*, *S. viscosus*, *Tussilago Farfara*, *Erigeron canadensis*, *Sonchus oleraceus*, *Taraxacum officinale*, *Galinsoga parviflora*, grasses (*Poa annua*, *Lolium perenne*, *Agrostis alba* [i.e. *stolonifera*, Ed.], *Holcus lanatus*, *Dactylis glomerata* and *Poa pratensis*), clovers (*Trifolium pratense*, *T. repens*), *Stellaria media*, *Plantago lanceolata*, *Salix Caprea*, *Sambucus nigra*, *Solanum Dulcamara*, *S. nigrum*. The author concludes that the order of arrival of the various species of plants is in no small degree a measure of the relative efficiency of their means of dispersal.—[H.] See also 721/1, *Typha latifolia* L.

(C) TOPOGRAPHICAL.

North Cornwall.—Hepburn (1943) gives an ecological account of the vegetation of the sea-cliffs between Trebetherick Point and Kellan Head.—[Wa.]

Devonshire.—Fraser, G. T. (1944: *Trans. and Proc. Torquay Nat. Hist. Soc.*, *9*, 9-12) contributes "Notes on the Flora of Dawlish Warren." —[Wa.]

Somerset.—The Report of the Botanical Section in the *Proceedings of the Somersetshire Archaeological and Natural History Society* for 1942, Vol. *88*, 106-112, 1943, contains a number of records supplied by the recorder, Dr W. Watson.—[Wa.]

Wiltshire.—Grose, J. D. (1944: Wiltshire Plant Notes; *Wilts. Arch. and N.H. Mag.*, *50*, 346-350) enumerates a large number of records made in 1942 and 1943. He also discusses (1944: The Impact of the War on the Wiltshire Flora; *l.c.*, 336-345) the effect of war activities on the flora of various habitats. The chief losses are forest trees and a few local ericaceous species. The range of a few native plants and of several aliens has been increased.—[Wa.]

The Reports of the Marlborough College Natural History Society for 1942 and 1943 contain the usual "Flower List" of records for the rarer plants and phenological observations; pp. 11-12, 11-12 respectively.—[Wa.]

Surrey: Bookham Common.—The ecological survey of the Common undertaken by the London Natural History Society is in need of more helpers with the vegetation mapping (*Lond. Nat. for 1943*, 22: 1944).—[Wi.]

Hertfordshire.—Meyer, D. & H. (1943: The Year's Botany; *Journ. Letchworth and Dist. N.H. and Antiquarian Soc.*, No. 3, 11-12) contribute a few records for the county, and report the rediscovery of *Drosera* *rotundifolia*, long thought to be extinct in the county. Brunt, A. W. (*l.c.*, 13-14) gives a brief account of " The Flora of Norton Common."—[Wa.]

ESSEX: Epping Forest.—In connection with the Survey undertaken by the London Natural History Society, an interesting Historical Sketch of the area is given by C. S. Bayes (1944: *Lond. Nat. for 1943*, 32-43), which is followed by some details concerning the climate.—[W.]

NORTHAMPTONSHIRE.—Allen, H. G. (1943: Botanical Notes, 1942 and 1943; *Journ. Northamptonshire Nat. Hist. and Field Club*, *30*, 118-119) gives a number of new locality records.—[Wa.]

WEST GLOUCESTERSHIRE AND NORTH SOMERSET.—Sandwith (1943, 1944) reports on the progress of floristic botany in the Bristol district.—[Wa.]

STAFFORDSHIRE.—Edees, E. S. (1943, 1944: *Trans. North Staffs. Field Club*, *77*, 38-42; 48-53) contributes some " Plant Notes and Records for 1942 and 1943." The rediscovery of *Potentilla verna* reported.—[Wa.]

MONTGOMERYSHIRE.—Wade and Webb (1943) contribute a large number of records, 175 species including adventives are recorded as new to the county.—[Wa.]

NORTH LINCOLNSHIRE, NOTTINGHAMSHIRE, DERBYSHIRE AND SOUTH-WEST YORKSHIRE.—Brown, J. (1944: Midlands Phanerogamia; *N.W. Nat.*, *18*, 325-326) enumerates a number of records for vice-counties 54, 56, 57, and 63.—[Wa.]

CHESHIRE.—Ellison and Wilson (1943: *Proc. Liverpool Nat. Field Club*, 1942, 6-10) give Notes on the Fauna and Flora of Hilbre Island.—[Wa.]

WEST LANCASHIRE.—Whellan (1943: Notes on the Flora of West Lancashire; *N.W. Nat.*, *17*, 354-357) discusses some changes in the flora of the St Anne's district and enumerates a number of records for the vice-county including *Papaver Lecoqii* Lam. at Silverdale, and *Spartina Townsendii* H. & J. Groves from the muddy bank of the Wyre near Shard Bridge, which are new to v.-c. 60.—[Wa.]

YORKSHIRE.—Sledge, W. A. (1943: Botanical Records Committee [Report]; Yorkshire Naturalists' Union: Annual Report, 1942; *Naturalist*, No. 804, 16-18) reports a number of new locality records for the vice-counties of 61, 62, 63, 64, and 65.—[Wa.]

NORTH-EAST YORKSHIRE.—The publication of " The Natural History of Goathland; III, The Flowering Plants and Ferns " has been continued by Flintoff, R. J. (1943: *N.W. Nat.*, *18*, 87-102, 194-204).—[Wa.]

NORTH-WEST YORKSHIRE.—Taylor, George (1944: Farnham Mires: A Notable Botanical Locality; *N.W. Nat.*, *19*, 26-28) gives a description of Farnham Mires together with a list of the more interesting plants. Farnham Mires was scheduled for reclamation and cultivation, but an approach was made to the appropriate agricultural committee and to the Wild Plant Conservation Board, and the reclamation plans were cancelled.—[Wa.]

WESTMORLAND AND CUMBERLAND.—Wade, A. E. (1943: An Exsiccata of Lake District Ferns; *N.W. Nat.*, *17*, 394-395) describes " Flintoft's

Collection of the British Ferns in the Lake District " and probably published about 1850. A list of the species with their localities is given.—[Wa.]

Dumbartonshire.—Lee, J. R., contemplates publishing " The Flora of Dunbartonshire, v.-c. 86. A " at an early date. (See *Glasgow Nat.*, *16*, 87, 88—plant records are to be found on pp. 88-90).—[Wi.]

Rhum.—Harrison *et al.* list plants collected in Rhum (v.-c. 104) and S. Uist (v.-c. 110), some of which are extracted in *Plant Records*. They include the arctic species *Lychnis alpina* L. and *Erigeron uniflorus* L. as well as further specimens of *Carex bicolor* All., all from Rhum.—[Wi.]

Vice-counties.—J. W. H. Harrison (1944: *Vasc.*, *29*, 18) attacks the article on " Vice-counties " in the last *Report* (pp. 524-6), but misrepresents the Committee there mentioned as having been " to all intents and purposes self-appointed," and makes other equally unfounded statements.—[Wi.]

(D) DISTRIBUTION.

(a) History of the British Flora.

The Glacial Period.—A further contribution to the study of the Glacial Period has been made by Sir George Simpson (1940: *P.L.S.*, *Sers. 152*, 190-219; Possible Causes of Change in Climate and their Limitations). First, the effects of various factors on temperature and rainfall are analysed and discussed. The distribution of land and water has little effect on the mean annual temperatures of latitudinal zones, those of the northern hemisphere, which contains most of the land, being only two or three degrees warmer. A glaciated southern hemisphere in the Permo-carboniferous Period coupled with a warm northern hemisphere, and a uniform temperature over the whole world as postulated in the Eocene Period, are both meteorologically impossible. But although the mean annual temperatures are little affected, the summer and winter temperatures may be greatly affected. At the equator there is little difference between the warmest and coldest months, but at 40° N. lat. the annual range is 30° C. over N. America and nearly 40° C. over Asia though only 6° C. over the eastern Atlantic. At 40° S., which runs mostly over the ocean, the range is small and only exceeds 6° C. near the land. At 60° N. the range over the N. Atlantic is only 8° C. but reaches 58° over Asia. It is the *summer* temperatures that are the deciding factor for glaciation: in general the temperature of the warmest month is about 5° C. in non-glaciated regions, and below it in glaciated; the temperature of the coldest month is of little importance. At 70° N. and S. lat. the mean annual temperatures are —10.7° C. and —13.3° C. respectively, not very different. But 70° S. is permanently glaciated down to sea level, whereas there is no permanent ice at sea level at 70° N. latitude: owing to the great continents on the equatorial side of 70° N. the mean temperature of the warmest month is 7.3° C., but on the equatorial side of 70° S. lies the Antarctic ocean and the midsummer temperature at 70° S. is −1.3° C.

Rainfall is more complicated, depending on three main factors, the latitudinal zonal effect, the orographic effect dependent mainly on great mountain ranges, and the origin of the prevailing winds (continental or oceanic). These three effects may work in the same or in opposite directions. In consequence the distribution of rainfall is very irregular, and extremes of rainfall may be found in all three zones. In spite of the different distribution of land in north and south latitudes, the rainfall in corresponding latitudinal zones is remarkably similar, and the totals to north and south the same to 1 per cent. Two main conclusions stand out:—(a) Average temperatures and rainfall for a zone and a year are the same in the two hemispheres irrespective of the distribution of land and water: it is the shape of the earth and the physical properties of the atmosphere which determine the main features of the climate of the earth as a whole; (b) glaciation and desert formation are very largely the effect of the local distribution of land and water. It would therefore seem that a possible cause of [local] climatic change might be found in [changed] distribution of land and water. But in the Pleistocene period several violent oscillations of climate occurred and although redistribution of land and water may have taken place there is no evidence for any oscillation. The violent changes must have some other cause.

Wegener and Köppen postulated shifting of the north and south poles, and in the Pleistocene Glacial Period the north pole was presumed to be between 5° and 7° nearer north-west Europe than it is now. But this does not account for the *series* of glacial and interglacial periods, and even they were not prepared to allow for corresponding pole-wanderings. In 1929 Milankovitch published a book on the mathematical theory of thermal phenomena produced by solar radiation, and Köppen and Wegener were impressed by the possible large changes in summer and winter radiation, the former of which has been shown to be all important in connection with glaciation. Milankovitch's curve showed four pairs of periods of cold summers with a long interval between the second and third periods, which Köppen and Wegener thought corresponded well with the curve of the four advances in the Swiss snow line denoted by Penck and Brückner as Günz, Mindel, Riss, and Würm [Glacial] periods. The changes in solar radiation were considered to have subdivided into four the Ice Age caused by the movement of the poles.

The possibility of correlating the glaciations with the radiation curve appealed to many workers. The remainder of this paper consists of a re-examination of this problem. Although the total radiation received remains constant, various factors (e.g., eccentricity of the earth's orbit) may produce colder winters balanced by hotter summers. About 11,100 years ago, according to Milankovitch's curve and Simpson's calculations, July temperatures in Scandinavia are between five and six degrees higher than to-day, which, although the January temperatures were between four and six degrees lower, might have permitted the northward extension of oak, birch, hazel, and maple known to occur after the Glacial Period ended. But at the time, presumed to be that of the Riss Glaciation, Milankovitch's curve (c. 233,000 years ago), shows the July temperature lowered $5\frac{1}{2}$° C. in lat. 55° N. Now between 40° N. and 80° N. the July temperature decreases at approximately 5.5° C. for 10° of latitude, i.e., at that time the July mean at 55° N. would be that of the present July mean of 65° N., where there is no approach to glaciation. But in the Riss glaciation 55° N. in America was heavily glaciated. And from Milankovitch's curve the other periods were even less favourable to glaciation. The temperature changes were calculated from a formula given by Milankovitch, but it can be shown that this formula gives changes about four times too large, as Simpson goes on to explain. Milankovitch's curve was based on changes in the earth's orbit: it follows that changes of solar radiation due to changes in the earth's orbit are always too small to produce glacial periods.

Changes in the energy of the sun are next to be considered. Penck and others assume that a glacial period must correspond with a lowering of the temperature of the earth's surface as a whole. But Meinardus demonstrates conclusively from an ingenious argument that the greater outflow of ice from the Antarctic Continent, known to have occurred, would be possible only with an *increase* in temperature and wind velocity (e.g., 5° C. and 24% increased wind vel.).

Simpson then restates and elaborates his previous explanation of how an increase in solar radiation may produce glaciation in an earth warmer as a whole. If the pluvial periods known to exist in other parts of the world can be shown to be correlated with the glaciations nearer the poles, this explanation will be corroborated. If they can be shown to be confined to the interglacial epochs, as Penck held, this explanation must fall, for it requires that there should be one pluvial period embracing the Riss and the Würm glacial epochs with its maximum in the interglacial between them.—[Wi.]

Pollen Analysis.—For a summary of an account of "Pollen Analysis and the Forest History of England and Wales" see H. Godwin (1940: *P.L.S.*, *Sess. 152*, 225-6). The typical pollen diagram for the post-Glacial period shows a first period of increasing warmth, in which successive forest types extend, a second period of optimum forest development and a third period of decreasing warmth with some extension of beech and hornbeam not previously important. The East Anglian zonation, which seems applicable to the whole country, is:—

VIII. Alder-Oak-Elm-Birch-(Beech)	[Romano-British].
[VII-VIII transition]	[Bronze and Early Iron Ages].
VII (a and b). Alder-Oak-Elm-Lime	[Neolithic].
VI (a and b). Pine-Hazel	[Mesolithic].
V. Pine	[Mesolithic].
IV. Birch-Pine.	

Some peat-beds submerged on the North Sea and off South Wales have been dated IV-V and second half of VI respectively.—[Wi.]

Pennington, W. (Mrs T. G. Tutin). (1943) Lake Sediments: the bottom deposits of the North Basin of Windermere with special reference to the diatom succession; *New Phyt.*, *42*, 1-27. Various plant pollens were identified.—[H.]

Coastal Peat Beds.—Godwin, H.; 1943: Coastal Peat Beds of the British Isles and the North Sea; *J. Ecol.*, *31*, 199-247. This was Dr Godwin's presidential address to the British Ecological Society, 1943. He summarises the distribution of coastal peats and describes the results of pollen analyses from many of them, including previously unpublished profiles from Somerset, Hampshire, Sussex, Norfolk, Cardiganshire, Skye and Jersey. He shows that submerged peats have been formed at all stages of the late glacial or post glacial period: the concepts " submerged forest period " and " Neolithic submerged forest period " should be discarded.—[H.]

Norfolk.—H. Godwin (1944: Age of origin of the " Breckland " heaths of East Anglia; *Nature*, *154*, 6-7) describes and figures pollen diagrams from Hockham Mere. A sharp increase in various non-tree pollens occurs above a horizon probably coincident with the opening of the Neolithic period and strongly suggests the origin of the Breckland heaths from pre-existing oak forest.—[H.]

(b) Various.

Williams, C. B. (1944: Some applications of the Logarithmic Series and the Index of Diversity to Ecological Problems; *J. Ecol.*, *32*, 1-44) describes the application of a logarithmic series to a number of problems of the division of individuals into species and of species into genera.—[Wa.]

Nature Reserves.—Nature Conservation in Britain (1943: Memorandum No. 3 of the Conference on Nature Preservation in Post-war Reconstruction. Issued by the Society for the Promotion of Nature Reserves, London: British Museum (Natural History). A synopsis of the principles involved in, and of the measures required to implement, a policy of nature conservation in Great Britain. (Discussed in *Nature*, *151*, 707-9).—[H.]

(G) NOMENCLATURE.

Nomenclature.—For an account of " A Discussion on the differences in observance between Zoological and Botanical Nomenclature." see *P.L.S.*, *Sess. 156*, 126-146. The discussion was summed up by Mr Paul de Laszlo.—[Wi.]

Practical problems of botanical and zoological nomenclature were discussed at a meeting of the Association of Applied Biologists reported by Rendle, B. J. (1944: Nomenclature Problems of the Applied Biologist; *Nature*, *154*, 812-14). The principle of priority is recognized both in botany and in zoology: its application in both is complicated by the resurrection of names published in obscure journals with consequent instability in nomenclature. International Committees both of botanists and of zoologists have been set up: the botanical one to prepare a list of names of economic plants to remain in use for a limited period, the zoological one with power to suspend the operation of the rules in particular cases in the interests of uniformity.—[H.]

(H) TAXONOMY.

Nomenclature and Taxonomy.—A memorandum from The Council of the British Ecological Society on Nomenclature and Taxonomy in the Biological Flora of the British Isles, in course of publication in the *Journal of Ecology,* appears in that journal, Vol. *31,* 93-96. The Council has decided to depart from the Recommendation in the International Rules that specific epithets which are old generic names or derived from personal names or vernaculars should be spelt with initial capitals. The terms to be used for the different types of intra-specific units are defined as far as that is possible with the incomplete knowledge of to-day.—[Wa.]

(K) MISCELLANEOUS.

Wardlaw, C. W. (1944: Unification of Botanical Science; *Nature, 153,* 125-130) considers selected aspects of the development of plant science and emphasises the need to achieve integration between the various branches of botany.—[H.]

Samuel King (1810-1888).—Crump, W. B. (1943: Samuel King and His Botanical Tours in Yorkshire; *N.W. Nat., 18,* 275-284) gives a short biography and publishes King's accounts of the tours he made to Malham in Craven in 1837 and to Teesdale in 1840.—[Wa.]

Botanic Gardens.—Cambridge University Botanic Garden will benefit very substantially from the Cory Bequest (1943: *Nature, 151,* 328). Oxford Botanic Garden has received a new Statute (1943: *Nature, 151,* 367).—[H.]

SYSTEMATICS OF PLANTS AND ANIMALS.

" Differences in the systematics of plants and animals and their dependence on differences in structure, function, and behaviour in the two groups " were debated at the Linnean Society in 1941 [*P.L.S., Sess. 153,* 272-287]. In closing the debate it was said that " it seemed that the only conclusion that could be drawn was the obvious one that all systematists were striving after the same ends, though the methods of approach were different."—[Wi.]

Classifications.—" A Discussion on Phylogeny and Systematics " was held at the Linnean Society in 1940 [*P.L.S., Sess. 152,* 234-255] in which adherents of both " phylogenetic " = " natural " and " artificial " = " logical " classifications, both botanists and zoologists, took part. " The President closed an interesting debate with a comment on the great diversity of view revealed and a remark that phylogenetic trees may serve in teaching if the student be cautioned that they are probably inaccurate."—[Wi.]

Chapman, K. H. (1944: *Nature, 153,* 768) emphasises the importance of the subjective element in all schemes of classification.—[H.]

Ecotype.—Gregor, J. W. (1944: The Ecotype; *Biol. Reviews, Camb. Phil. Soc., 19*, 20-29) discusses this concept at some length. Ecotypic differentiation is defined as "hereditary differentiation in respect of morphological and/or physiological attributes occasioned by the selective action of the habitat environment." It is suggested that when it is necessary to refer to habitat populations the ecotypic significance of which has not been established the term ecotype should be avoided, and some non-comittal term such as ecodeme should be used instead.—[Wa.]

SYSTEMATIC.

6/7. Ranunculus Flammula L. The history of a white-flowered individual in Sussex is described by B. Barnes (1942: *P.L.S., Sess. 154*, 58-62). It was found in 1927 and subdivided between 1927 and 1933 into more than two dozen plants in the author's garden, Chelsea Physic Garden, and Kew. For some reason all these and the original plant left in the wild died in the winter of 1933-34, which was not a hard one and which left the normal yellow plants in the garden unhurt. Whether the individual plant (although so much divided!) had reached its natural length of life or whether some feature of the winter affected the white but not the yellow form, must be left an open question. The white spots and patches on old petals due to bleaching is also discussed.

6/9. Ranunculus arvensis L. A detailed study of the flower has been made by I. H. Burkill (1941: The Make-up of the Flower of *Ranunculus arvensis* Linn.—a study in evolution of isomerism in phanerogamous flowers; *P.L.S., Sess. 153*, 161-215). A pure line was raised and the object was to seek for indications of how cyclic flowers evolved. A tendency towards isomerism was uncovered. Many data of counts or resulting graphs are given.—[Wi.]

39. Cardamine. Biswas, K. (1943: *Trans. Bot. Soc. Edin., 33*, 416-430) in "Observations on Indian *Cardamine*" include *C. hirsuta* L., *C. impatiens* L. and *C. pratensis* L. The first is spreading as a weed throughout India and Burma from the plains to the temperate hills of the Western and the Eastern Himalayas. *C. impatiens* is common in the Western and Eastern Himalayas. *C. pratensis* is chiefly confined to the Western Himalaya and is abundant in West Tibet. *C. hirsuta* L. is used in a broad sense and includes *C. flexuosa* With.—[Wa.]

54/15. Brassica alba (L.) Boiss. Dale, W. T., and Scott, L. I. (1943: *Proc. Leeds Phil. and Lit. Soc.*, Scientific Sec., *4*, 111-122) examine the behaviour of the mucilage layer found on the outer surface of the mature seeds.—[Wa.]

59. Capsella. Dale, W. T., and Scott, L. I. (1943: *Proc. Leeds Phil. and Lit. Soc.*, Scientific Sect., *4*, 111-122), describe the structural characteristics of the testa.—[Wa.]

60/1. CORONOPUS DIDYMUS Sm. Recorded as a weed on the leeward coast of Fiji at Nadarivatu, 1941, by Greenwood, W. (1943: *P.L.S.*, *Sess. 154*, 93; as *Senebiera didyma* Pers.).—[Wi.]

77/1. CAKILE MARITIMA Scop. This species " increased surprisingly along the beaches at seaside resorts owing to barbed-wire protection " in N.E. Yorkshire and Durham (1942: *Vasc.*, *27*, 23). —[Wi.]

88. VIOLA. Fothergill, P. G. (1944: Studies in *Viola*; IV, The somatic cytology and taxonomy of our British species of the genus *Viola*; *New Phyt.*, *43*, 23-35), gives the following new chromosome numbers:—

2n=20, *Viola odorata* L. vars. *subcarnea*, *semperflorens* and *immaculata*;
2n=26, *V. variata*, *V. Lloydii*, *V. Lejeunei*, *V. Pesneaui*, *V. segetalis*, *V. Curtisii*, and *V. variata* var. *sulphurea* (special case in which 2n=26+2);
2n=34, *V. obtusifolia* (and n=17), *V. ruralis*, *V. Déséglisei* (and n=17);
2n=40, *V. contempta*;
2n=48, *V. lutea* var. *amoena* Hens., *V. nana*.

The following numbers are confirmed: *V. odorata* L., *V. hirta* L., *V. silvestris* Lam. with 2n=20; *V. canina* L. and *V. Riviniana* Rchb. with 2n=40.

His conclusions, drawn from the study of the cytotaxonomy of the group, are: A. Section *Nomimium*: *V. hirta* and *V. odorata* are closely related but Becker is justified in separating them into two distinct groups. *Canina* and *Riviniana* are as closely allied to each other as is either to *silvestris*, if not more so; the chromosome number of *silvestris* is half that of the other two, but these two are not simple polyploids. B. Section *Melanium*: The series *Tricolores*, *Luteae-Curtisii* and *Nanae* of Drabble require some revision from the cytological evidence. Cytologically *Lloydii*, *Lejeunei*, *variata*, *variata* var. *sulphurea*, *Pesneaui*, and *Curtisii* belong to the same group, the *Tricolores*. Thus *Pesneaui* and *Curtisii* are extracted from Drabble's *Luteae-Curtisii* group, which is left with the single species *V. lutea* and its variety *amoena*. This separation of *lutea* from *tricolor* spec. coll. is justified, but *V. nana* and *V. lutea* are seen to have very similar chromosome complements. Drabble's creation of a separate series, *Nanae*, is not perhaps necessary, while the cytological evidence rather supports Rouy and Foucaud's inclusion of both *lutea* and *nana* in the collective species *V. Kitaibeliana* Roem. & Schult. Finally, *V. contempta* requires further investigation. In chromosome number, etc., it resembles the 2n=40 series, while systematically it is placed among the *tricolor* pansies with 2n=26.—[H.]

88/1. VIOLA STAGNINA Kit. Taylor, J. M. (1943: *Viola stagnina* Kit. in Yorkshire; *N.W. Nat., 18*, 112), reports on the occurrence of this plant at Thorne Waste.—[Wa.]

102. ARENARIA. Polunin, N. (1943: *Nature, 152*, 451-2) describes the distribution of *A. humifusa* Wahl. and suggests that it may be found to include Britain.—[H.]

112/14. HYPERICUM PERFORATUM L. is a pestilent weed in Australia: an account of its attempted control by beetles is summarised by Imms, A. D. (1944: *Nature, 153*, 785).—[H.]

112/14b. HYPERICUM PERFORATUM var. ANGUSTIFOLIUM Gaud. Control measures also include the sowing of competitive species (*Trifolium subterraneum* in association with perennial grasses, e.g. *Phalaris tuberosa* and *Lolium perenne*) and chemical treatment. See Moore, R. M., and Cashmore, A. B.; *Australian Council for Scientific and Industrial Research Bull.*, 151 (quoted 1943: *Nature, 152*, 746).—[H.]

127. GERANIUM. G. N. and F. F. Jones (1943: *Rhodora, 45*, 5-26, 32-54) have made a "Revision of the Perennial Species of Geranium of the United States and Canada." *G. pratense* L. (p. 13) is adventive in fields and meadows of North-eastern United States and adjacent Canada and Newfoundland.

137/1. EUONYMUS EUROPAEUS L. Alternate host of *Aphis fabae* (*A. rumicis*): Blackman, G. E. (1944: *Gard. Chron., 116*, 57).—[H.]

138. RHAMNUS. Godwin, H. (1943: Biological Flora of the British Isles; *Journ. Ecol., 31*. 66-92) gives a biological and ecological account of *Rhamnus Frangula* L. and *R. catharticus* L.—[Wa.]

142/1. ACER PSEUDOPLATANUS L. Urquhart, B. P. (1943: *Quart. Journ. For., 37*, 89-91) contributes notes on natural regeneration.—[H.]

142/1. ACER PSEUDOPLATANUS L. Jones, E. W. (1944: Sycamore and Maple Problems; *N.W. Nat., 18*. 322-324) refers to (a) the problem of the date of the introduction of the sycamore, and (b) the distribution and reproduction of the maple, with a view to obtaining information on these points.—[Wa.]

142/1. ACER PSEUDOPLATANUS L. Howard, A. L. (1944: The Sycamore Tree; *Nature, 153*, 348-9) contributes notes on the history and uses of sycamore and maple in Britain. The "seed" is a remarkable example of a natural rotating mechanism: Brabazon, Lord (1944: *Nature, 153*, 498).—[H.]

176/12. VICIA SATIVA L. For details of visits of bees and flies, see C.R. (1943: *Vasc., 28*, 16).—[Wi.]

176/35b. VICIA TETRASPERMA (L.) Mnch. var. TENUISSIMA Druce is beginning to appear in North America; Maine, Vermont; Massachusetts, New York, and Oregon, according to M. L. Fernald (1943: *Rhodora, 45*, 480).

184/12. FILIPENDULA ULMARIA (L.) Maxim. is well established by Lake Superior, Minnesota, with leaves varying white, green, or mottled green and white beneath: Lakela, O. (1944: *Rhodora, 46*, 27).

194. Rosa. Gustafsson, Å., and Schröderheim, J. (1944: *Nature, 153*, 196) report cross breeding experiments on various *R. canina, rubiginosa* and *rugosa* biotypes from the results of which they infer that the fertility of the hips shows an obvious and significant influence on the amount of ascorbic acid present. Heslop-Harrison, J. W., and Jackson, E. A. D. (1944: *Nature, 153*, 404-5) on the other hand ascribe the results to heredity. Melville, R. (1944: *Nature, 153*, 405) adduces other data to show that hereditary differences in vitamin product operate independently of fertility.—[H.]

J. W. H. Harrison (1942: *Vasc., 27*, 17-18) criticises Pyke & Melville's view that there is co-ordination between the latitudinal range of British rose species and their vitamin content, disagreeing with those authors' summaries of distribution: he states that the actual co-ordination is with the time of ripening—the earlier the ripening the greater the content of vitamin C. He also rejects the view that a possible source of variation is the presence of unrecognised hybrids since all British roses except *R. arvensis* and *R. spinosissima* are crypthybrids reproducing, in general, apomictically. Later (*Vasc., 27*, 25) he criticises Darlington's attempt to co-ordinate increasing vitamin content with increasing polyploidy, pointing out that *R. mollis* Sm., which averages the highest vitamin content, is only a tetraploid, and also giving further evidence in favour of his own correlation. (And see *Vasc., 28*, 10, 25).—[Wi.]

211/12. Sedum villosum L. Typically the plant produces flowering shoots and no barren shoots, and the plant dies after flowering. Miss K. B. Blackburn (1942: *Vasc., 27*, 21-22) describes plants, forming a cabbage-like rosette of leaves, found at Barrington (v.-c. 67). On cultivation these grew into a cluster of axillary branchlets, all with an apical rosette of leaves which, in July or August, fell off, rooted at the nodes and became new plants. Both at Barrington and at Allenheads some late-flowering plants had both flowers and vegetative shoots.—[Wi.]

243/1. Conium maculatum L. Dallman, A. A. (1944: *N.W. Nat., 19*, 66-68) replying to a note by L. Nathan (*loc. cit.*, 66) concerning Hemlock causing nettle rash in New Zealand says that there can be little doubt that *Conium maculatum* is the plant concerned as it has established itself in the Dominion. He discusses the alkaloids found in the species and suggests that increased sunlight and environmental factors in New Zealand may have resulted in increased coniine content.—[Wa.]

277/1. Heracleum Mantegazzianum S. & L. Burke, F. (1943: *N.W. Nat., 18*, 216) records this from Upton, Cheshire, as a garden escape. It is reputed by the inhabitants of the Upton district to possess strong vesicant properties, and instances of blistering due to handling the plant are reported, but the writer was unsuccessful in efforts to produce vesication on his own skin.

Dallman, A. A. (1943: *loc. cit.*, 216-217) refers to its occurrence in a number of English counties, and in Dumfriesshire and Co. Dublin. He finds that the fruits will float for a considerable time and suggests the possibility of this fact accounting for its occurrence and extension in Westmorland, where A. Wilson recorded it on the "Banks of the River Kent below Kendal, well established, and locally plentiful near Sedgwick."—[Wa.]

286/1. ADOXA MOSCHATELLINA L. Seeds sown by Miss K. B. Blackburn produced, in the second spring, "besides the two green cotyledons, one small simple ivy-like leaf and a white thread-like stem which turned straight down into the ground and produced, at once, a pair of thick white scales characteristic of the underground parts of the plant;" (*Vasc.*, *27*, 30-31).—[Wi.]

296/2. GALIUM MOLLUGO L. has been found as a weed in California and Oregon: Howell, J. T. (1943: *L. Western Bot.*, *3*, 261).

301. VALERIANA. Dr Barbara Todd's chromosome counts of plants of *Valeriana officinalis* L. *sensu lato* from 29 localities (unspecified) showed the same number (56). Dr Drabble's distinctions (*B.E.C. 1932 Rep.*) between four different forms broke down in the field; Raasay populations uniform in leaf showed all fruit-types, and on cultivation narrow-leaved plants changed into broad-leaved. One Northumberland population showed stolon length varying from 0 to 20 cm. (*Vasc.*, *27*, 26-27).—[Wi.]

301/1. VALERIANA OFFICINALIS L. T. A. Sprague (1944: *P.L.S.*, *Sess. 155*, 93-104) describes the result of field-studies in the Cotswold Hills. The species seems to be considerably affected by shade and damp, sunlight and dryness. Vegetative reproduction is by (a) soboles and rarely by (b) bulbils, both of which are described in detail. Neither the classification given by Drabble (1933) nor by Krejer (1930) seemed to be satisfactory.

308/1. SCABIOSA COLUMBARIA L. This species has been found in New York state in two places, and may have originated from garden sources as it has been cultivated.—R. T. Clausen (1943: *Rhodora*, *45*, 220-221).

320. ERIGERON. Harrison (1943: *J.B.*, *80*, 114) records the finding of "*Erigeron uniflorus* L." in small quantity on two low somewhat bare ledges on Barkeval, Isle of Rhum. It is said to differ substantially from material of *E. eriocephalus* Vahl., *E. unalaschkensis* Vierh. (two Arctic species), *E. uniflorus* L., and *E. alpinus* L. (two Alpine species), seen by him. The material is withheld for further examination, but it is recorded again as *E. uniflorus* L. by Harrison *et al.* (1944: 144). [The plants of this affinity are very critical; if it is one of the Arctic species it needs determination by one with experience of the Arctic Flora.] —[Wi.]

354/1. GALINSOGA PARVIFLORA Cav. Four short letters relating to the occurrence of this plant in South Lancashire, together with a figure, are published in the *N.W. Nat.*, *18*, 217-220 (1943).—[Wa.]

383/8. Senecio viscosus L. Turner, A. (1943: *N.W. Nat.*, *18*, 110) records a population of this plant in a potato field, at Nelson, Lancashire with the ray florets radiating outwards instead of being recurved. Nowers, J. E. (1943: *N.W. Nat.*, *18*, 215-216) also records a similar form from Darlington, Durham.—[Wa.]

419. Hieracium. Fernald (1943: *Rhodora*, *45*, 317-325) in " Notes on Hieracium " refers to *H. murorum* L. as " locally adventive from Europe," and *H. vulgatum* Fries as an " All-inclusive series of introductions." *H. sabaudum* L. is now abundant in places at Cambridge, Massachusetts.

422/1. Leontodon hispidus L. Among material of this species cultivated for study of variation in leaf-form and hairiness, several abnormalities were observed:—Flowering stems with two capitula: florets tubular except at the very tip: ripe fruit two-seeded: one cotyledon bifurcated.—Miss K. B. Blackburn (1943: *Vasc.*, *28*, 29).—[Wi.]

425/6. Lactuca alpina (L.) Hook. f. Roger. J. Grant (1943: *Trans. Bot. Soc. Edin.*, *23*, 404-406) contributes some ecological notes on this plant in Scotland. He suggests that as the few remaining colonies are beyond the reach of animals, rain and wind are perhaps the chief enemies, although weather alone will not prevent its survival.—[Wa.]

435/1. Campanula glomerata L. has been found in Minnesota: Lakela, O. (1944: *Rhodora*, *46*, 28).

55. PRIMULACEAE. A paper by G. V. Last, on the family, and dealing chiefly with the British species of *Primula*, which was read before the Liverpool Botanical Society, is printed in full in the Report of the Society (1943: *N.W. Nat.*, *18*, 127-129).—[Wa.]

460/2. Primula vulgaris Huds. Marsden-Jones, E. M., and Turrill, W. B. (1944: Experiments on Colour and Heterostyly in the Primrose (*Primula vulgaris* Huds.), *New Phyt.*, *43*, 130-134) describe the results of breeding experiments made with variously coloured " red " (anthocyanin) primroses (from Pembrokeshire) which probably owed their sap pigment to genes introduced from gardens.—[H.]

467/2. Anagallis arvensis L. Seedling. Abnormalities are described by Barnes, B. (1943: *P.L.S.*, *Sess. 154*, 88-91) who analysed the features of 1174 young wild seedlings: 33 had three cotyledons but only 14 of these had the first whorl of foliage leaves three-membered. In spite of increased assimilating surface the tricotyls were less vigorous and more backward than the dicotyls.—[Wi.]

480/7. Gentiana Amarella L., " cf. var. uliginosa Wahl." Found in 1937 in S. Greenland by N. Polunin (1943: *P.L.S.*, *Sess. 154*, 117).

500/1. Anchusa sempervirens L. as a garden plant. See Hutchinson, J. (1943): Evergreen Alkanet; *Gard. Chron.*, *113*, 238-239 (with line drawing).—[H.]

534/1. Antirrhinum majus L. The "Comparative Cytology of sterile intra- and fertile inter-varietal tetraploids of *Antirrhinum majus* L." is detailed by Sparrow, A. H., Ruttle, M. L., and Nebel, B. R. (1942: *Amer. J.B.*, *29*, 711-715). The relatively higher homozygosity of the intra-varietal tetraploids is considered the probable cause of their greater sterility. Autotetraploids are often characterised by reduced fertility.—[Wi.]

539. Limosella. An account of *L. subulata* Ives, *L. aquatica* L., and their hybrid, in Glamorgan, is given by E. Vachell (1941: *Trans. Cardiff Nat. Soc.*, *71*, 32-35).

549. Melampyrum. Britton, C. E. (1943: The Genus *Melampyrum* in Britain; *Trans. Soc. Edin.*, *33*, 356-379) gives descriptions with a key of the species, subspecies, varieties and principal forms found in the British Isles.—[Wa.]

558/13. Mentha arvensis L. An account, under two varieties—"*typica*" [? var. nov.] and "*villosa* (Benth.) comb. nov."—of some of the N. American forms of this species is given by Stewart, S. R. (1944: *Rhodora*, *46*, 331-336).—[Wi.]

588/8. Plantago lanceolata L. Denton, M. E. (1943: *N.W. Nat.*, *18*, 110-112) describes and illustrates an abnormal inflorescence with fasciated and spirally twisted stems.—[Wa.]

600. Chenopodium. Aellen, P., and Just, T. (1943: *American Midland Naturalist*, *30*, 47-76) publish a "Key and Synopsis of the North American Species of the Genus *Chenopodium*." Sixty-two species together with their varieties are included. Twenty-four of the species are represented in the British Plant List either as natives or adventives. The varieties *glomerulosum* (Rchb.) and *lanceolatum* (Muhl.) of *C. album* are reduced to the rank of forma and *C. Borbasii* Murr. to the rank of variety under the same species. The Genus *Roubiera* is treated as a section of *Chenopodium*.—[Wa.]

618/14. Rumex Acetosa. Löve, A. (1943: *Nature*, *152*, 358-9) describes a Y-linked inheritance of asynapsis.—[H.]

633. Ulmus. Howard, A. L. (1943: *Nature*, *152*, 636-8) writes on the British elms. Melville, R. (1944: The British Elm flora; *Nature*, *153*, 198) briefly summarises the British elms, their status and distribution.—[H.]

635/1. Cannabis sativa L. Todd, A. R. (1943: The Hemp Drugs; *Endeavour*, *2*, 69-72) discusses the history and chemical composition of the hemp drugs.—[Wa.]

642. Betula. For notes on the ecology of *B. alba* and *B. pubescens* see Penistan, M. J. (1944: *Birch. Quart. Journ. For.*, *38*, 78-88).—[H.]

645/1c. Corylus Avellana v. contorta Hort. in Gloucestershire: Arnold, R. E. (1944: *Gard. Chron.*, *116*, 182). Not fertile: Van de Weyer, W. (1944: *Gard. Chron.*, *116*, 210).—[H.]

646. Quercus. Jones, E. W. (1943: The Oaks in Britain; *N.W. Nat.*, *18*, 213-214) refers to some of the problems relating to the two British oaks and the hybrid between them. The kind of information required in connection with the study he is making of the oaks is set out in detail.—[Wa.] Howard, A. L. (1944: The Oak Tree, *Nature*, *153*, 438-41) contributes notes on the history and uses in Britain.—[H.]

649/1. Fagus sylvatica L. Howard, A. L. (1944: The Beech Tree; *Nature*, *154*, 492-4) discusses uses in Britain.—[H.]

650. Salix. In " The Cytology of *Salix* in Relation to its Taxonomy," J. Wilkinson (1944: *Ann. Bot.*, N.S., *8*, 269-284) continues the analysis of the chromosome complements of a number of species and hybrids. The basic number in the genus is 19 or 22, and the various irregularities, fragmentation and polyploidy, probably also mutation, have played their parts in evolution. *S. lapponum* can be diploid or tetraploid, and *S. Myrsinites* diploid or decaploid).—[Wi.]

Wilkinson, J. (1944: The Cytology of *Salix* in relation to its Taxonomy; *Ann. Bot.*, N.S., *8*, 269-284) has determined the following chromosome numbers (in addition to confirming others previously reported):—*lapponum* L., 38 (diploid on base 19); *lapponum*, 76 (tetraploid); *daphnoides*, 57 (triploid on 19); *Myrsinites*, 190 (decaploid on 19); *herbacea*, 38 (diploid on 19); *Caprea*, 76 (tetraploid on 19); *triandra*, 88 (tetraploid on 22); and those of eleven hybrids. Polyploidy (e.g. in *S. lapponum* and *S. Myrsinites*) may be unaccompanied by systematic difference. The author describes the metaphase chromosome morphology of 27 species and eleven hybrids and draws general conclusions on karyophylesis within the genus. Howard, A. L. (1944: The Willow Tree (*Salix* sp.); *Nature*, *154*, 835-7) quotes sizes of remarkable specimens of various species.—[H.]

651/2. Populus tremula L. An account (with bibliography) of a giant form (*gigas*) discovered in 1935 in Scania, South Sweden, and since also in Middle and North Sweden, which is a triploid (somatic chromosomes, 57) is given by T. A. Sprague (1940: *P.L.S.*, *Sess. 152*, 111-113).—[Wi.]

661/1. Corallorrhiza trifida Châtel. Downie, D. G. (1943: Notes on the Germination of *Corallorrhiza innata*; *Trans. Bot. Soc. Edin.*, *33*, 380-382) records the symbiotic germination of the seeds and establishes the fact that the normally associated endophyte is a member of the Basidiomycetes, the perfect state of which is at present unknown.—[Wa.]

665/1. Goodyera repens (L.) R. Br. Downie, D. G. (1943: Source of the Symbiont of *Goodyera repens*; *Trans. Bot. Soc. Edin.*, *33*, 383-390) shows that the mycorrhiza associated with this orchid grows in the surface litter, but does not survive in the older compact humus and that the association is therefore confined to the surface layers. Evidence is submitted showing that the symbiont exists, either as an epiphyte or in the form of air borne spores, on the bifoliar spurs of Scots Pine before shedding, a fact which is of importance in understanding the distribution of the fungus in the soil and the colonisation of the latter by the orchid.

Mollison, J. E. (1943: *Goodyera repens* and its Endophyte; *loc. cit.*, 391-403) describes the first infection and subsequent rate of digestion of the endophyte in the embryo, its distribution in the adult plant and the infection of mature plants.—[Wa.]

668/3(3). EPIPACTIS VECTENSIS (Steph.) Brooke & Rose. Travis, W. G. (1943: *N.W. Nat.*, *18*, 326) records this from a pine plantation on the Formby to Freshfield sandhills, S. Lancs,, v.-c. 59, where it was observed in 1942.—[Wa.]

669/3. ORCHIS SIMIA Lam. Rose, F. (1943: A Note on the Rediscovery of *Orchis Simia* (Lamarck) in Oxfordshire; *J.B.*, *80*, 102-3) briefly discusses its relationship with *O. purpurea*, *O. militaris* and *Aceras anthropophora*.—[Wa.] [The station appears to be the old one in which it has always been known.—ED.] The Kent and Oxford forms are compared.—[Wi.]

676/3. IRIS SPURIA L. Bradley, C. R. Sylvester (1943: *Proc. Dorset N.H. and Arch Soc.*, *64*, 118-120) contributes " Some Notes on the Occurrence of *Iris spuria* in Dorset," where it appears to have been growing for over half-a-century. He considers that the occurrence of this iris both in Lincolnshire and Dorset is not the result of a garden escape or other accidental introduction; but that it is a rare but true native of Britain. See *B.E.C. 1941-42 Rep.*, 505.—[Wa.]

688/1. TAMUS COMMUNIS L. I. H. Burkill (1943: *P.L.S.*, *Sess. 155*, 31-34) describes three leaves with double apex and one with the petiole doubled.

702/4. ALLIUM VINEALE L. Scott, R. H. (1944: *Agriculture*, *51*, 162-170) describes the Life History of the Wild Onion and its bearing on Control. The production of bulbils and bulbs is dealt with in some detail.—[Wa.]

702/8. ALLIUM CARINATUM L. The plant thus recorded by N. L. Britton in 1901 from Pennsylvania is *A. oleraceum* L.—Fernald, M. L. (1944: *Rhodora*, *46*, 59-60).—[Wi.]

718. JUNCUS. Richards, P. W. (1943: Biological Flora of the British Isles; *Journ. Ecol.*, *31*, 51-59, 60-65) gives detailed biological and ecological accounts of *Juncus macer* S. F. Gray and *J. filiformis* L.—[Wa.]

718/6. Juncus balticus Dethard. Its occurrence in S. Greenland confirmed by Polunin, N. (1943: *P.L.S.*, *Sess. 154*, 117).

718/9. Juncus acutiflorus Ehrh. has been rediscovered in N. America on Little Miquelon: Le Hors, L. (1944: *Rhodora*, *46*, 312).—[Wi.]

721/1. Typha latifolia L. A clump of this species was found in 1942 " growing superbly " in a water-filled bomb-crater produced in November 1940 by a land mine on the site of the Manor House, Goldings Hill, near Loughton, Essex (*Essex Nat.*, *27*, 189).

735/1. Triglochin maritima L. Cook, W. R. I., and Cleal, B. (1943: *Ann. Bot.*, *N.S.*, *7*, 347-355) describe hypertrophy of the leaf bases caused by *Plasmodiophora* sp.—[H.]

737. Potamogeton. " Studies of British Potamogetons " are continued by J. E. Dandy and G. Taylor (1944: *J.B.*, *80*)—XVI. "×*Potamogeton olivaceus* (*P. alpinus* × *crispus*)," of which the synonymy and history as a British plant are fully detailed (pp. 117-120)—XVII. "Further Remarks on *Potamogeton Berchtoldii*," with discussion and rejection of *P. Millardii* Harrison (pp. 121-124)—XVIII. "*Potamogeton praelongus* in Crag Lough," with correction of mis-citation by Bennett in *Top. Bot. Suppl.* (p. 124). E. C. Ogden (1943: *Rhodora*, *45*, 57-105, 119-163, 171-214) gives an account of " The Broad-leaved Species of *Potamogeton* of North America north of Mexico. Plate 746 shows fruits of several British species. On p. 75 is a " Key to the Species Based on the Anatomy of the Stem," and this is followed by tables of characters as they occur in various subsections. Distribution maps are also given. The paper is concluded by a long index of determinations of numbered exsiccata.—[Wi.]

737/1. Potamogeton natans L. Found in 1937 in S. Greenland by Polunin, N. (1943: *P.L.S. Sess. 154*, 117).—[Wi.]

737/9×25. ×Potamogeton Heslop-Harrisoni W. A. Clark (1942: *Vasc.*, *27*, 20)—" *P. gramineus* × *P. Berchtoldii* " [which should be written *P. Berchtoldii* × *gramineus*.—Ed.]—*nomen nudum*, from 110, O. Hebr.; N. Uist, Loch Crogary.—[Wi.]

746/9. Scirpus nanus Sprengel. Gilly, Charles Louis (1944: Notes on Geographical Distribution; I, *Eleocharis parvula* (R. & S.) Link; *Amer. Midland Nat.*, *31*, 499-500) summarises the distribution of this species in North America. A primary distributional area following the North Atlantic arc pattern is recognised, the exact western limits in North America are not yet known. Other occurrences in North America are attributed to migratory birds or to the dumping of ballast.—[Wa.]

753. Carex. In " Notes on British Carices.—VI," E. Nelmes (1944: *J.B.*, *80*, 105-112) discusses " Hudson's Species." *C. disticha* Huds. is accepted in its usual sense as =*C. intermedia* Good. *C. spicata* Huds. is accepted for *C. contigua* Hoppe. *C. inflata*

Huds. is regarded as *nomen dubium*, and the alterations made by Hudson in the second edition of the *Flora Anglica* indicate that he then transferred the name to *C. laevigata* Sm.—[Wi.]

753/37. "CAREX MAGELLANICA Lam. *sensu lato*." Found in 1937 in S. Greenland by Polunin, N. (1943: *P.L.S., Sess. 154*, 117).—[Wi.]

767/1. HIEROCHLOE ODORATA (L.) Beauv. Record for South Greenland confirmed by Polunin, N. (1943: *P.L.S., Sess. 154*, 117).—[Wi.]

770/1. ALOPECURUS PRATENSIS L. is established at Duluth, Minnesota: Lakela, O. (1944: *Rhodora, 46*, 25).—[Wi.]

780/2(2). AGROSTIS GIGANTEA Roth. Found in 1937 in South Greenland by Polunin, N. (1943: *P.L.S., Sess. 154*, 117).—[Wi.]

780/3. AGROSTIS TENUIS Sibth. Its occurrence in S. Greenland confirmed by Polunin, N. (1943: *P.L.S., Sess. 154*, 117).—[Wi.]

824/12. POA FLEXUOSA Sm. Its occurrence in S. Greenland confirmed by Polunin, N. (1943: *P.L.S., Sess. 154*, 117).—[Wi.]

830/4. AGROPYRON REPENS (L.) Beauv. Sharman, B. C. (1943: *Nature, 151*, 170) observed nucleoli (maximum number, 6) in the cells of developing tissues. Sharman, B. C. (1943: *Nature, 152*, 276-7) has observed a periclinal division at the growing point.—[H.]

840/1. TAXUS BACCATA L. Howard, A. L. (1944: The Yew Tree (*Taxus baccata*); *Nature, 154*, 215-6) quotes size of remarkable British specimens.—[H.]

841/1. PINUS SYLVESTRIS L. Howard, A. L. (1944: The Scots Pine (*Pinus sylvestris*); *Nature, 154*, 679-80) contributes notes on economic history and uses.—[H.]

847/1. PTERIDIUM AQUILINUM (L.) Kuhn. has been supposed hitherto to take two seasons to develop each new frond. Braid, K. W., and Conway, E. (1943: *Nature, 152*, 750-1) show from the growth of a sporeling (originally 2-3 in. across with 5 or 6 fronds) during a single season that the plant may produce 85½ in. of exploratory rhizome and 16 green fronds within six months and hence conclude that here is one explanation of the rapid spread of bracken. The frond and the plant, and their size and form in relation to the status of the species as an invader or a constituent of stable vegetation, are described by Watt, A. S. (1943: Contributions to the ecology of bracken (*Pteridium aquilinum*); II, The Frond and the Plant; *New Phyt., 42*, 103-126). Hunter, J. G. (1944: *Nature, 153*, 656) has studied the composition of the frond throughout its growing season. Copisarow, M. (1943: Reclamation of brackenland; *Nature, 151*, 139) describes a successful attempt to reclaim an area of bracken in Denbighshire.—[H.]

851. ASPLENIUM. Alston (1940) lists the supposed hybrids of *Asplenium* found in Britain. Some are hybrids with *Phyllitis Scolopendrium*, and an artificial hybrid of the latter with

Ceterach is mentioned, although it did not live long enough to be described. The *Asplenium* hybrids found on the continent but not yet observed in Britain are also listed, all hybrids of *A. Adiantum-nigrum*, with *A. Ruta-muraria* (×*A. Perardi* Litard.), *A. septentrionale* (×*A. Souchei* Litard.), *A. Trichomanes* (×*A. dolosum* Milde), and *A. viride* (×*A. Woynarianum* Asch. & Gr.). See also Corrections to *B.P.L.*—[Wi.]

868/1. Azolla filiculoides Lam. Williams, E. G. (1943: Further Notes on *Azolla filiculoides* Lam.; *N.W. Nat.*, *18*, 326-327) records some observations made in 1941-1943 on the frequency of this plant in the Cheshire Pond, near Chester.—[Wa.]

870/7. Lycopodium Selago L. Case, I. M. (1943: Periodicity in the Development of Fertile and Sterile Zones in *Lycopodium Selago*; *New Phyt.*, *42*, 93-97. Sporangial rudiments are laid down between May and July in a definite fertile zone; they take two years to complete their development.—[H.]

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Wade, A. E.; 1944: Notes on the Genus *Myosotis*. I. *Myosotis lutea* (Cav.) Pers.; A Later Homonym. II. The Typification of *Myosotis scorpioïdes* L. em. Hill. III. The Invalidity of the Name *Myosotis repens*; J.B., *80*, 127-129.

—— and Webb, J. A.; 1943: Montgomeryshire Plant Records; N.W. Nat., *18*, 52-68.

CORRECTIONS TO PREVIOUS REPORTS.

1937 Rep., p. 629. Remarks under 753/45 refer to the North American species *C. stricta* Lam., and not to *C. stricta* Good., which is a later homonym.—E. Nelmes.

1941-42 Rep., p. 474, line 14 from base: for " J. W. Heslop Harrison " read " J. Heslop Harrison."

REPRINTS FOR SALE (continued from previous page).

COLLECTED NOTES.

Druce (1918). Papaver Rhoeas, Centaurium scilloides, Ajuga genevensis, Cystopteris . . . Dickeana	1	6
—— (1921). Silene italica, Tillaea aquatica, Solidago cambrica	1	0
Euphrasia septentrionalis, Orchis latifolia, Poa trivialis var. septentrionalis ...	1	0
—— (1923). Rumex arifolius, Senecio erraticus ...	1	0
—— (1924). Galium debile, New Taraxaca, Menthae	1	0
—— (1926). New Alchemillas, New Hieracia, New Taraxaca	1	0

MISCELLANEOUS.

Species Studies in Plants. Marsden-Jones & Turrill (1930)	1	0
Phenological Observations made at Oxford. Bellamy (1927)	1	0
Evolution and Classification of Flowering Plants. Parkin (1926)	1	0
The . . . Carpel . . . Parkin (1933)	1	0
Bombed Sites, London. Lousley (1941-2)	1	0
Bombed Sites, London. Lousley (1943-4)	1	6

OTHER PUBLICATION FOR SALE.

Druce. Mosses and Liverworts of Oxfordshire	2	6

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X	A Key to the Species of Rubi of the London Catalogue. Rilstone (1934)	2	0
	British Brambles. Trower (1928)	3	6
	Bramble Notes. Watson (1930)	1	6
	Some British Rubi. Watson (1931)	1	0
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	Valeriana officinalis L. and its Allies in Great Britain. Drabble (1932)	1	0
	× Senecio londinensis. Lousley (1943-4)	1	0
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X	British Centaureas of the nigra group. Britton (1921)	1	0
X	Centaurea Scabiosa L. Britton (1922)	1	0
X	Centaurea pratensis Thuillier. Britton (1926)	0	6
	Taraxacum vulgare (Lam.) Schrank. Druce 1919	1	0
	Qu'est ce que le Solanum Dillenii? Thellung (1926)	0	6
	Euphrasia. Pearsall (1925)	1	0
	Euphrasia atroviolacea and E. variabilis. Druce and Lumb (1923)	1	0
	Rhinanthus. Wilmott (1939-40)	2	0
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	Notes on Mentha. Fraser (1930)	1	0
X	The British Species and Forms of Thymus. Ronniger (1923)	2	0
	The Distribution of Thymus in Britain. Ronniger (1927)	1	0
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	Rumex arifolius. Druce (1924 Interim Rep.)	1	0
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